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CERTIFICATE OF SERVICE

I, Grant K. Schmidt, do hereby certify that as an attorney of record for the Plaintiffs herein, that I have on this 29th day of January 2024, duly served the above and foregoing by electronic filing upon the following:

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EXHIBIT A



COLLISION RECONSTRUCTION ENGINEERING REPORT

Regarding:

The Estate of Nehemias Roderico Pivaral Santos v. Caylee Erin Smith and Eastman Chemical
Company

In United States District Court for the Northern District of Texas

Case No.: 3:22-CV-02714-K

Our File Number: 36-13811

Prepared for:

Eastman Chemical Company and Caylee Erin Smith

Prepared by:

Paul J. Montalbano, P.E.

Focus Forensics, LLC

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September 28th, 2023

A handwritten signature in black ink, appearing to read "Paul J. Montalbano", is positioned above a horizontal line.

Paul J. Montalbano, P.E.

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INTRODUCTION

On Saturday, April 30th, 2022, at approximately 3:48 p.m., a single vehicle versus pedestrian collision occurred on northbound Interstate 45, just south of Bonner Avenue, in Angus, Navarro County, Texas. A 2011 Toyota Camry was parked, partially in the inside travel lane of northbound Interstate 45 due to a left front flat tire. The Toyota occupants were Ms. Evelyn Moreno (age 19), Mr. Nehemias Pivaral Santos (age 19), Ms. Dina Yamileth Regalado Soto (age 23), Mr. Melvin Alexander Diaz Fuentes (age 21), and Mr. Erick Jeremias Pivaral Santos (age 21). A 2021 Ford Explorer, driven by Ms. Caylee Erin Smith (age 23), was traveling northbound on Interstate 45 when it struck Mr. Nehemias Pivaral Santos, resulting in fatal injuries.

Paul J. Montalbano, P.E. of Focus Forensics was retained by Eastman Chemical Company on April 26th, 2023, to perform an independent collision reconstruction engineering analysis. This report will express the opinions and conclusions reached during the course of the collision reconstruction analysis, and the basis for these opinions and conclusions.

All opinions are expressed to a reasonable degree of engineering certainty based on the evidence in this case and the relevant application of reliable methods accepted within the collision reconstruction engineering community. This report is based on the information available to us at this time, as described in the Basis of Report section. Should additional information become available, we reserve the right to determine the impact, if any, of the new information on our opinions and conclusions.



OPINIONS AND CONCLUSIONS

1. The subject Toyota, originally driven by Ms. Evelyn Moreno, experienced a left front tire failure while traveling northbound on Interstate 45.
2. While a flat tire reduces the handling characteristics of a vehicle, it does not eliminate the ability to steer the vehicle off of the roadway, as evidenced by Ms. Evelyn Moreno's ability to come to a controlled final rest on the left side of the roadway. Steering to the right was equally possible.
3. There was more than sufficient space to fully vacate the travel lanes and park the 6-foot-wide Toyota either on the 7 to 8-foot wide inside paved shoulder, the 10 to 11 foot-wide outside paved shoulder, or the 50-foot-wide traversable grass shoulder.
4. Rather, Ms. Evelyn Moreno parked the Toyota still partially within the left travel lane, occupying approximately 2.1 feet (not accounting for the side mirror) of the 11.6-foot-wide inside northbound travel lane, providing approximately 9.5 feet of remaining available space for northbound traffic to pass the Toyota.
5. Given the Ford's width of approximately 6.6 feet, there was sufficient room for the Ford to pass the Toyota within the remaining available 9.5-foot width of the left lane. It was not necessary for the Ford to change lanes in order to pass the parked Toyota.
6. The Ford did not contact the Toyota.
7. The Ford contacted Mr. Nehemias Roderico Pivaral Santos's head while he was actively bending over, with his head extending beyond the parked Toyota, and into the inside northbound travel lane, approximately 1 foot into the path of the Ford.
8. The two tire marks photographed next to, or swerving away from the Toyota were *not* from the subject Ford Explorer, rather from a vehicle with smaller, thinner tires. The location and characteristics of these tire marks were indicative of one or more vehicles making an evasive swerving maneuver from left to right at the location of the parked Toyota.
9. There was no physical evidence or indication in the GPS data or the bearing data that the Ford was traveling or steered on or towards the left shoulder leading up to the incident location, as suggested by the plaintiff.
10. Regardless of the lateral position of the Ford at impact, Mr. Santos's head was extending *at least* 3.2 feet into the 11.6-foot-wide inside northbound travel lane, or *at least* 1.1 feet outboard of the right face of the parked Toyota, and directly into the path of northbound traffic; had Mr. Santos simply not bent over into the northbound travel lane, the incident would not have occurred.



11. Impact occurred between 3:48:51 to 3:48:52 p.m. Central Daylight Time (CDT). The last text message Ms. Smith sent was at 3:48:43 CDT, or approximately 8 to 9 seconds prior to the collision. At that point in time, Ms. Smith was between 1,022 to 1,146 feet from impact.



DISCUSSION

Police Report

According to the Texas Traffic Crash Report prepared by Officer Danielle Lee-Winston of the Richland Police Department, the collision occurred on northbound Interstate 45 near mile marker 223, in Angus, Navarro County, Texas, on April 30th, 2022, at approximately 3:51 p.m. Conditions were reported as daylight, clear and dry. The posted speed limit was listed as 75 mph. There was no construction or workers in the area at the time of the crash and the roadway was described as straight and level.

The VIN number for the 2021 Ford Explorer was listed as 1FMSK7DH7MGB01430 and was operated by Ms. Caylee Erin Smith (age 23). The VIN number for the 2011 Toyota Camry was listed as 4T4BF3EK8BR212323, with the following listed occupants:

1. Mr. Nehemias Roderico Pivaral Santos (age 19) – listed as pedestrian
2. Ms. Dina Yamileth Regalado Soto (age 23) – listed as back left seat occupant
3. Mr. Melvin Alexander Diaz Fuentes (age 21) – listed as back center seat occupant
4. Mr. Erick Jeremias Pivaral Santos (age 21) – listed as back right seat occupant

A not-to-scale police diagram generally documented the collision location (Figure 1).

Location

Astronomical records indicated that the sun was in the southwestern sky at an altitude of approximately 52 degrees, and an azimuth angle of approximately 252 degrees clockwise from due north (Figure 2). Historical weather reports indicated that there was no precipitation around the time of the collision, clear skies and approximately 86 degrees Fahrenheit. Sun and weather were not contributing factors to this collision event.

Interstate 45 in the area of the crash was a 6-lane divided highway generally running north and south, serving as a major thoroughfare between Houston and Dallas (Figure 3 to Figure 16). The incident occurred approximately 1.1 miles south of exit 225 (Bonner Avenue). Northbound Interstate 45 in the area of the incident was flat and level. The northbound approach was straight for approximately 0.33 miles prior to the incident. Approximately 0.5 miles prior to the incident, the northbound direction curved to the left by approximately 13 degrees over the course of approximately 0.17 miles (Figure 17), providing a straightaway to the accident location for approximately 1/3rd of a mile, or over 1500 feet. The speed limit was 75 mph for the area of the collision (Figure 18).



CAC Forensics, LLC photographed, measured and drone-mapped the scene of the collision on April 26, 2023, or approximately 1 year after the crash (Figure 19 to Figure 21). Based on historical Google aerials (Figure 22 to Figure 23), historical aerial flyover images (Figure 24) and historical Google Street View images (Figure 25 to Figure 41), the roadway was unchanged from the time of the collision to CAC's site inspection and mapping. Each direction consisted of three 11 to 12-foot-wide travel lanes, one 7 to 8-foot wide inside paved shoulder, and one 10 to 11-foot-wide outside paved shoulder with 50-foot-wide traversable grass shoulders. Each direction was separated by a 3.5-foot-tall median barrier wall. Because of the median barrier wall and curvature of the roadway to the left on the northbound approach, an unlimited sightline was not established for the inside northbound travel lane approach until approximately 1742 ft, or 0.33 miles prior to the incident location, or approximately 16 seconds at the speed limit of 75 mph, or approximately 13 seconds at a speed of approximately 90 mph.

Scene Evidence

Roadway physical evidence, final rest positions and body fluid was extensively documented from photographs taken on scene, body camera videos, post-incident investigation and historical aerial and street view documentation.

- At final rest, Mr. Nehemias Roderico Pivaral Santos's body was on top of the solid yellow line dividing the inside northbound through lane and left shoulder, with his head and torso on the inside shoulder, and his legs from the knees down within the inside northbound travel lane (Figure 42 to Figure 43). A blood trail from the right side of the inside northbound travel lane leading towards the shoulder and Mr. Nehemias Roderico Pivaral Santos's final rest indicated that Mr. Nehemias Roderico Pivaral Santos was moved from an initial rest position from within the inside northbound travel lane towards the shoulder, consistent with witness testimony. It was uncertain as to the exact orientation or position of Mr. Nehemias Roderico Pivaral Santos's initial rest position within the inside travel lane prior to being moved, however, it was generally located on the right half of the inside northbound travel lane, directly adjacent to the rear axle of the Toyota, or on top of the most northeastern blood mark.
- The Toyota had a flat left front tire, with the factory jack extended and located underneath the driver's door rocker panel (Figure 44 to Figure 45). The Toyota appeared to have been lunged forward by a few inches, tilting the extended jack forward. There was no lateral movement of the Toyota based on this evidence.



- A tire marking, consistent with rolling on a flat tire, was seen leading up to the Toyota's left front tire and was photographed to have originated from the inside northbound travel lane (Figure 46 to Figure 51). The tire mark continued from the inside northbound travel lane to the Toyota's rest position, with the Toyota partially on the shoulder and partially within the northbound travel lane. There was no lateral offset from the final rest position of the Toyota and the flat tire mark, indicating no lateral movement of the Toyota from impact.
- A faint swerving mark was visible, starting in the inside northbound travel lane, swerving to the right prior to the Toyota's rest position (Figure 52 to Figure 55).
- A secondary parallel swerving tire mark appeared, starting at the Toyota's right rear, located approximately 1 foot to the shoulder-side of the previously discussed swerve mark (Figure 56 to Figure 63).
- The tire mark closest to the shoulder consisted of *three* distinct tread grooves within the marking (Figure 64).
- The tire mark to the right of the 3-groove tire mark did not display distinct tread groove patterns within the mark but was of similar width.
- The Ford came to a controlled final rest approximately 520 feet north of the Toyota's parked position.

2021 Ford Explorer

Manufacturer specifications for the 2021 Ford Explorer (VIN: 1FMSK7DH7MGB01430) indicated an XLT trim with four doors, a 4-cylinder turbo-boosted gasoline engine and rear wheel drive. The overall length was 16.6 feet, overall width was 6.6 feet, overall height was 5.8 feet and wheelbase was 9.9 feet. The Ford's door-jam sticker indicated the standard tire size was 255/65R18, indicating 10-inch-wide tires. All four of the Ford's installed tires were 265/65R18, indicating the actual tire widths were approximately 10.4-inches wide.

The Ford Explorer had localized and distinct contact damage to its left front corner and left side. All contact damage to the Ford was less than 4 feet in elevation.

- The only damage to the front face of the Ford was at the Ford's left front headlight, spanning in height from 3 to 3.5 feet from the ground (Figure 65). There was no front-face contact damage below 3 feet from the ground.



- There was a small, localized, and circular contact area to the left front corner of the hood of the Ford, just at and above the left front headlight (Figure 66 to Figure 69). The direct contact damage extended approximately 1 foot inboard from the left side of the Ford.
- The left front sheet metal fender was peeled out and crumpled rearward with visible blood and body matter on the inside and outside of the fender (Figure 70 to Figure 72).
- There was a gap of approximately 9.0 feet in contact evidence from the left front corner of the Ford to the left rear quarter panel of the Ford (Figure 73 to Figure 74). The left rear quarter panel of the Ford exhibited direct contact in the form of dents, scuffing and body matter transfer (Figure 75 to Figure 81).
- All tires of the Ford Explorer had *four* tread grooves within their tread width (Figure 82).

2011 Toyota Camry

Manufacturer specifications for the 2011 Toyota Camry indicated a base model, four-door, 4-cylinder gasoline engine and front wheel drive. The overall length was 15.8 feet, overall width was 6.0 feet, overall height was 4.8 feet and wheelbase was 9.1 feet.

The Toyota Camry had damage and body matter transfer on the rear bumper, rear trunk lid, right rear taillight, right rear quarter panel and right C-pillar, consistent with post-impact contact with from Mr. Nehemias Pivaral Santos's body (Figure 83 to Figure 87).

ANALYSIS

Flat Tire Response

The subject Toyota, originally driven by Ms. Evelyn Moreno, experienced a left front tire failure while traveling northbound on Interstate 45. While a flat tire reduces the handling characteristics of a vehicle, it does not eliminate the ability to steer the vehicle off of the roadway, as evidenced by Ms. Evelyn Moreno's ability to come to a controlled final rest on the left side of the roadway. Steering to the right was equally possible. There was more than sufficient space to fully vacate the travel lanes and park the 6-foot-wide Toyota either on the 7 to 8-foot wide inside paved shoulder, the 10 to 11 foot-wide outside paved shoulder, or the 50-foot-wide traversable grass shoulder.

Tire Mark Analysis

The subject Ford Explorer's tires consisted of *four* tread grooves (Figure 88), conclusively indicating the tire mark closest to the shoulder with *three* tread grooves was unrelated to the Ford's



movements. However, the tire mark to the right of the 3-groove tire mark did not display distinct tread groove patterns within the mark, requiring further analysis of its relevancy to the Ford's movements.

Photogrammetric Analysis

Photogrammetry is a well-known, peer-reviewed, highly validated engineering methodology used to reconstruct positional and measurement data from photographs and videos. There are various types of photogrammetric analysis, including graphical methods, scaling methods, photo-overlay or reverse projection, rectification and standard or traditional photogrammetry [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17].

Based on four different types of photogrammetric analysis performed (Figure 89 to Figure 113):

- The Toyota was occupying approximately 2.1 feet (not accounting for the side mirror) of the 11.6-foot-wide inside northbound travel lane, providing approximately 9.5 feet of remaining available space for northbound traffic to pass the Toyota.
- The tire mark with no discernable tread grooves was approximately 6.7 inches wide, with a known tolerance / accuracy of plus or minus 0.25 inches.

Relevancy of Tire Marks

The Ford was photo-scanned by CAC, LLC, providing a 3-dimensional point cloud with an average residual, or accuracy, of plus or minus 1/8th of an inch [18,19,20,21,22,23]. The width of the tread patch of the left side tires that physically contact the ground was measured to be approximately 8.4 inches wide (Figure 114 to Figure 117), or approximately 1.7 inches wider than the physical tire marks on the roadway. Therefore, the two tire marks photographed next to, or swerving away from, the Toyota were *not* from the subject Ford Explorer, rather from a vehicle with smaller, thinner tires. The location and characteristics of these tire marks were indicative of one or more vehicles making an evasive swerving maneuver from left to right at the location of the parked Toyota.

Diagrams

2-dimensional overhead diagrams were constructed, demonstrating the final rest positions and relevant physical evidence on the roadway reconstructed from Photogrammetry analysis (Figure 118 to Figure 121).



Impact Alignment

Contact matching is a critical component of accident reconstruction, whether it is aligning the damage of two vehicles, or aligning the damage between a vehicle and a human body, in order to determine the relative positions and/or orientations of the two objects at impact. The Ford exhibited localized circular contact damage to its left front headlight at elevation ranging from 3.0 to 3.5 feet from the ground and an inboard depth of approximately 1 foot, with no underlying elevated contact damage directly below it. The contact damage was circular in nature, with a contact radius consistent with the size of a head. There was blood and body fluids / matter within the round contact damage, specifically to the pointed leading edge of the left front fender of the Ford. There were pieces of skull and brain matter found on the roadway from Mr. Nehemias Roderico Pivaral Santos, consistent with the testimonial evidence that Mr. Nehemias Roderico Pivaral Santos was struck on the right side of the head by the Ford. Because all frontal contact damage to the Ford was exclusive to an elevation between 3.0 to 3.5 feet from the ground, with a lateral intrusion of approximately 1 foot, with no underlying damage to the front bumper below 3 feet in elevation, and because of the corresponding transfer onto the Ford's contact area, it was concluded that Mr. Nehemias Roderico Pivaral Santos was actively bending over at the time of impact, with *only* his head sticking out in front of the approaching Ford, with the right side of his head exposed to the oncoming Ford, and his body, torso and legs outside of the Ford's path. Had Mr. Nehemias Roderico Pivaral Santos been kneeling with his head vertically in line with his body, there would have been body to front bumper contact and resulting contact damage to the front bumper of the Ford below 3 feet in elevation. Additionally, Mr. Nehemias Roderico Pivaral Santos would have been thrown forward and likely been run over by the left side tires of the Ford if his body was inboard of the Ford's path. Instead, Mr. Nehemias Roderico Pivaral Santos was rotated and thrown diagonally away from the Ford, and subsequently struck the back right corner of the parked Toyota. Therefore, at impact, Mr. Nehemias Roderico Pivaral Santos was actively bending over with his head extended beyond his center of gravity, and his head extending outward of the parked Toyota, into the northbound travel lane, breaching the path of the Ford by approximately 1 foot. (Figure 122 to Figure 132). This was consistent with the testimony of Caylee Erin Smith and Erick Jeremias Pivaral Santos, both stating that Mr. Nehemias Roderico Pivaral Santos was in the process of bending over or picking something up at the time of impact.



Toyota Camry Tire Replacement

The owner's manual of the Toyota Camry indicated the removal of 3 items before getting access to the spare tire (Figure 133 to Figure 134):

1. Loosen and remove the retaining nut holding down the spare tire cover (carpeted pad).
2. Remove spare tire cover (carpeted pad covering spare tire).
 - a. The jack handle and wheel nut wrench are located on the underside of the spare tire cover.
 - b. The jack is located on the right side of the spare tire.
3. Loosen and remove bolt and spacer holding down spare tire.
4. Lift and remove spare tire.

Ford Digital Data

The airbag control module (ACM) of the Ford was imaged, however, because the contact with Mr. Nehemias Roderico Pivaral Santos did not meet the minimum change in speed requirement of 5 mph within a 150 millisecond time frame, it did not record any data, further corroborating that there was no contact with the Toyota.

The infotainment system of the Ford was imaged, providing gear shift data, call log data, track points and speed data for the day of the collision. The track point data contained GPS position and speed data at 1-second intervals, providing data for just shy of 40 miles of travel prior to impact (Figure 135 to Figure 139). The data indicated that the Ford was traveling up to approximately 90 mph leading up to impact, with a recorded speed reduction down to approximately 86 mph just prior to impact. Impact occurred between 2:48:51 to 2:48:52 p.m. Central Standard Time (CST) (Figure 140 to Figure 141), or between 3:48:51 to 3:48:52 p.m. Central Daylight Time (CDT).

The track point data from the infotainment system consisted of bearing data, providing the relative angle counterclockwise from due north in degrees (Figure 142 to Figure 146). The data was consistent with a parallel orientation with the roadway leading up to the collision location, followed by a 3-degree swerve to the right around the location of impact. There was no indication within the bearing data that the Ford drifted to the left shoulder prior to the incident. Additionally, there was no documented positional deviation from the left northbound travel lane towards the left shoulder in the GPS track point coordinates. While infotainment GPS data has been validated to be accurate within 3.5 to 7.5 feet [24,25,26], there was no observed lateral deviation in any of the data points prior to the incident location.



There was no physical evidence or indication in the GPS data or the bearing data that the Ford was traveling or steered on or towards the left shoulder leading up to the incident location, as suggested by the plaintiff.

Cell Phone Data

Ms. Smith's cell phone data was imaged, providing text records for the time leading up to the collision. The last text message Ms. Smith sent was at 3:48:43 CDT, or approximately 8 to 9 seconds prior to the collision. At that point in time, Ms. Smith was between 1,022 to 1,146 feet from impact.

Lateral Impact Location

Because the two visible swerve tire marks photographed were concluded to be unrelated to the subject Ford's movements, and because GPS track point data can have a tolerance of 3.5 to 7.5 feet, it was indeterminate as to the *precise* lateral location of the Ford and Mr. Santos at the time of impact. However, two versions were presented within the testimony and both were incorporated into the analysis framework to assist the jury in determining which version was more probable.

Plaintiff Theory of Impact Location

Plaintiff's theory indicated that the Ford drifted onto the left shoulder leading up to the impact location and implemented a swerve to the right, missing the Toyota by approximately "15 to 20 centimeters" [testimony of Mr. Erick Jeremias Pivaral Santos] or approximately 6 to 8 inches. Therefore, because the Toyota was approximately 2.1 feet into the travel lane, the left side of the Ford was no closer than approximately 2.6 feet from the yellow line when factoring in a 6-inch clearance, and Mr. Santos's head was at least 3.6 feet from the yellow line (given the 1-foot contact overlap). However, to be the most conservative and in favor for the plaintiff, the swerve angle away from the Toyota was accounted for when determining Mr. Santos's lateral head position at impact in order to allow for a 6-inch clearance between the Ford and the Toyota by the time the Ford reached the Toyota's position, after striking Mr. Santos's head, and accounting for the continued lateral movement of the Ford from its swerving movement from left to right. Implementing an emergency swerve from the left side shoulder at 86 to 90 mph would result in a maximum clockwise heading angle change of approximately 3.1 degrees clockwise from straight for the Ford [27,28]. When factoring in a 3.1-degree heading angle for the Ford from Mr. Santos's head contact to the right rear corner of the Toyota, the left front corner of the Ford could have been no closer than



approximately 2.2 feet from the solid yellow line at impact in order to provide at least 6 inches of clearance by the time it reached the parked position of the Toyota (accounting for its 3.1-degree swerve to the right). Therefore, Mr. Santos's head was *at least* 3.2 feet into the northbound travel lane (Figure 147), or *at least* 1.1 feet outboard of the right face of the parked Toyota at impact, based on plaintiff's theory of impact location. Even under plaintiff's theory, had Mr. Santos not bent over into the travel lanes outboard of the parked position of the Toyota, the collision would not have occurred.

Defense Theory of Impact Location

Ms. Smith testified, "...I scooted over enough in my own lane to miss the vehicle", but she did not think she entered the middle travel lane. Modeling her lateral position to the right side of her travel lane, consistent with the GPS-indicated lateral position of the Ford, placed the left side of the Ford approximately 4.0 feet away from the yellow line (Figure 148). Because Mr. Santos's head was located approximately 1 foot inboard from the left side of the Ford at contact, then under this scenario, Mr. Santos's head was located approximately 5.0 feet into the 11.6-foot wide inside travel lane at impact, or approximately 2.9 feet beyond the right side of the parked Toyota. Had Mr. Santos not bent over into the travel lanes outboard of the parked position of the Toyota, the collision would not have occurred.

Avoidance

Contact overlap was only approximately 1 foot inboard of the Ford's path, so had either party moved laterally away from one another by 1 foot, the collision would have been avoided. Therefore, had the Ford driver swerved a foot farther to the right, the collision would have been avoided, however, it was indeterminate as to how much advanced notice Ms. Smith was provided of Mr. Nehemias Roderico Pivaral Santos actively bending over into her path. Conversely, had Mr. Nehemias Roderico Pivaral Santos simply not bent over with his head outboard of the parked Toyota's right side, then the collision would not have occurred, regardless of where the Ford was. In other words, regardless of the lateral position of the Ford at impact, had Mr. Santos simply not bent over into the northbound travel lane, the incident would not have occurred.



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- 27) Muttart, J., "Influence of Age, Secondary Task and Other Factors on Drivers' Swerving Responses before Crash or Near-Crash Events," SAE Technical Paper 2015-01-1417, 2015.
- 28) Leakkaw, P., Panichpapiboon, S., "Real-Time Vehicle Maneuvering Detection with Digital Compass," IEEE Access 2021.3097752, 2021.
- 29) Muttart, J., "Development and Evaluation of Driver Response Time Predictors Based upon Meta Analysis," SAE Technical Paper 2003-01-0885, 2003.
- 30) Muttart, J., "Quantifying Driver Response Times Based Upon Research and Real Life Data," Proceedings in the Third International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design, 2005.
- 31) Toxopeus, R., Atalla, S., Kodsi, S., Oliver, M., "Driver Response Time to Midblock Crossing Pedestrians," SAE Technical Paper 2018-01-0514, 2018.



BASIS OF REPORT

1. Texas Crash Report 2200089, Texas Incident Report 2200089, emailed witness statement from Caylee Smith to Corporal Lee-Winston and five 911 calls.
2. Police photographs and videos
 - a. 57 scene photographs
 - b. 10 Ford Explorer photographs
 - c. 18 body camera / dash camera videos of first responders
3. Inspection photographs and videos
 - a. 297 Ford Explorer photographs from Axiom taken on 09/06/2022
 - b. 401 Ford Explorer photographs from CAC taken on 09/06/2022
 - c. 461 site inspection photographs and 4 drive through videos from CAC taken on 04/26/2023
 - d. 476 Toyota Camry photographs from CAC taken on 06/22/2023
4. Miscellaneous photographs
 - a. 13 photographs of Mr. Nehemias Pivaral Santos.
5. CDR and Infotainment system download data for the Ford Explorer.
6. Ms. Smith cell phone text records.
7. CDR download data for the Toyota Camry.
8. Aperture report dated July 10th, 2023.
9. Deposition transcripts:
 - a. Dina Yamileth Regalado Soto
 - b. Erick Jeremias Pivaral Santos
 - c. Erick Jeremias Pivaral Santos
 - d. Evelyn Moreno
 - e. Melvin Alexander Diaz Fuentes
 - f. Caylee Erin Smith
10. Published historical maps, satellite aerial, flyover aerial and street view images of the incident location.
11. Published astronomical and meteorological data for the day of the crash.
12. Manufacturer specifications and dimensional data for the 2021 Ford Explorer and 2011 Toyota Camry.



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13. Owner's manual for the 2011 Toyota Camry.
14. Publications listed under Citation section of this report.



ATTACHMENTS

1. Police Diagram, not-to-scale (Figure 1)
2. Scene / Location Images (Figure 2 to Figure 64)
3. Ford Explorer (Figure 65 to Figure 82).
4. Toyota Camry (Figure 83 to Figure 87).
5. Analysis and diagrams (Figure 88 to Figure 148).
6. Curriculum Vitae and Testimony History List for Paul J. Montalbano. P.E.



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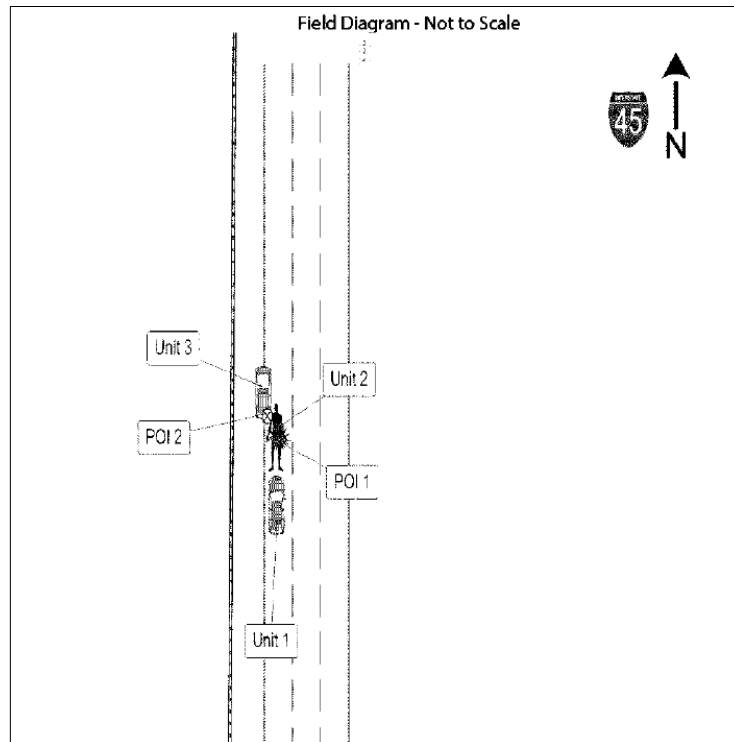


Figure 1: Not-to-scale police diagram.

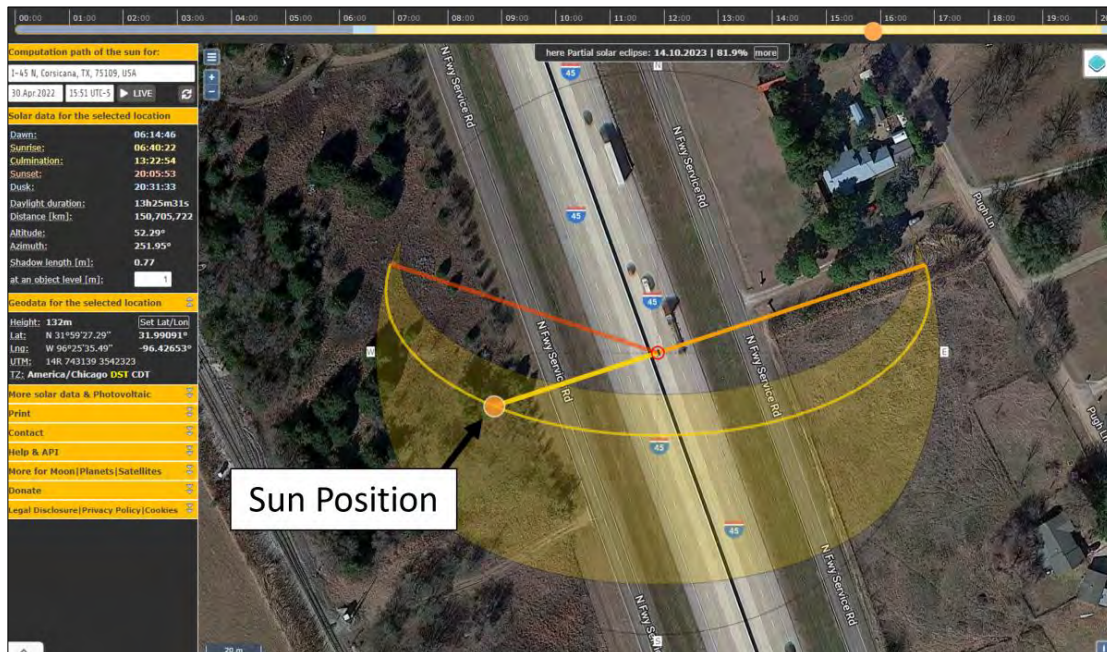


Figure 2: Sun position at time of collision.



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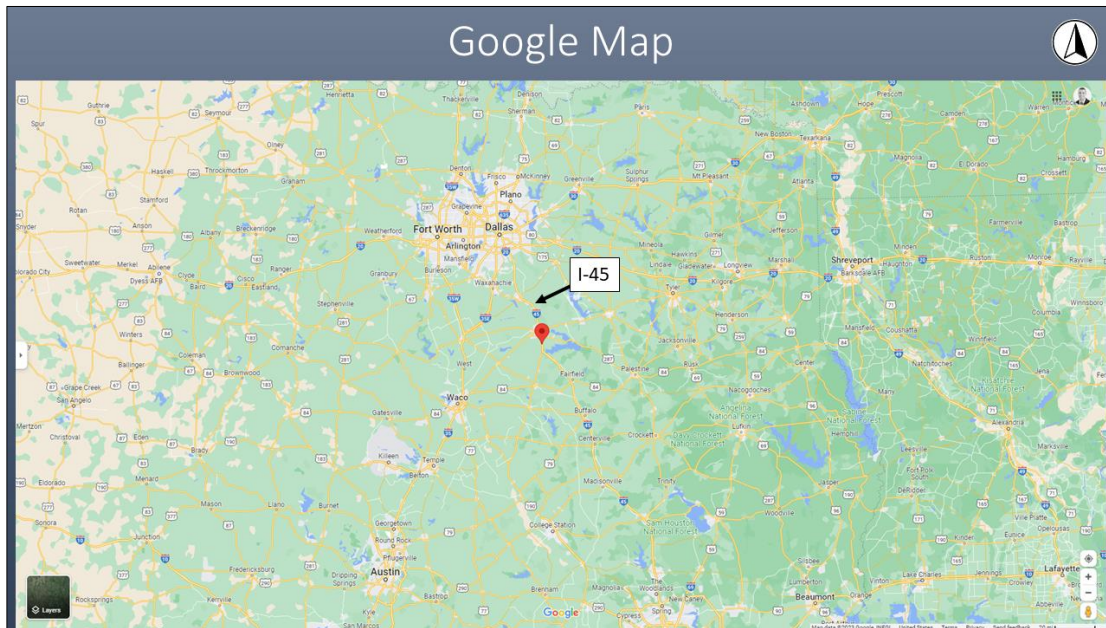


Figure 3: Google map.

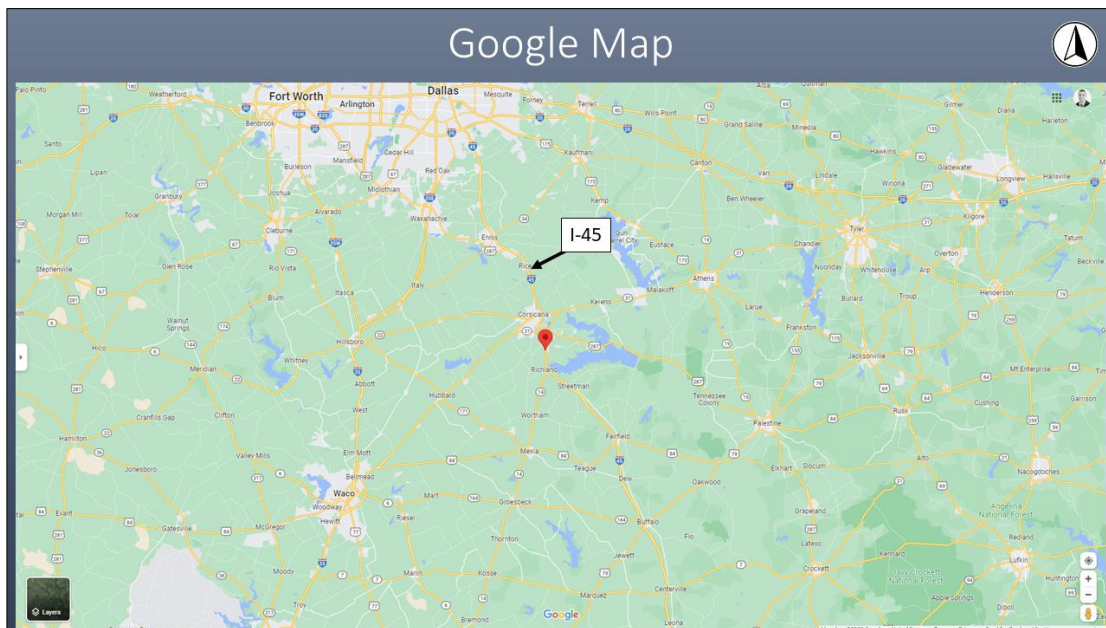


Figure 4: Google map.



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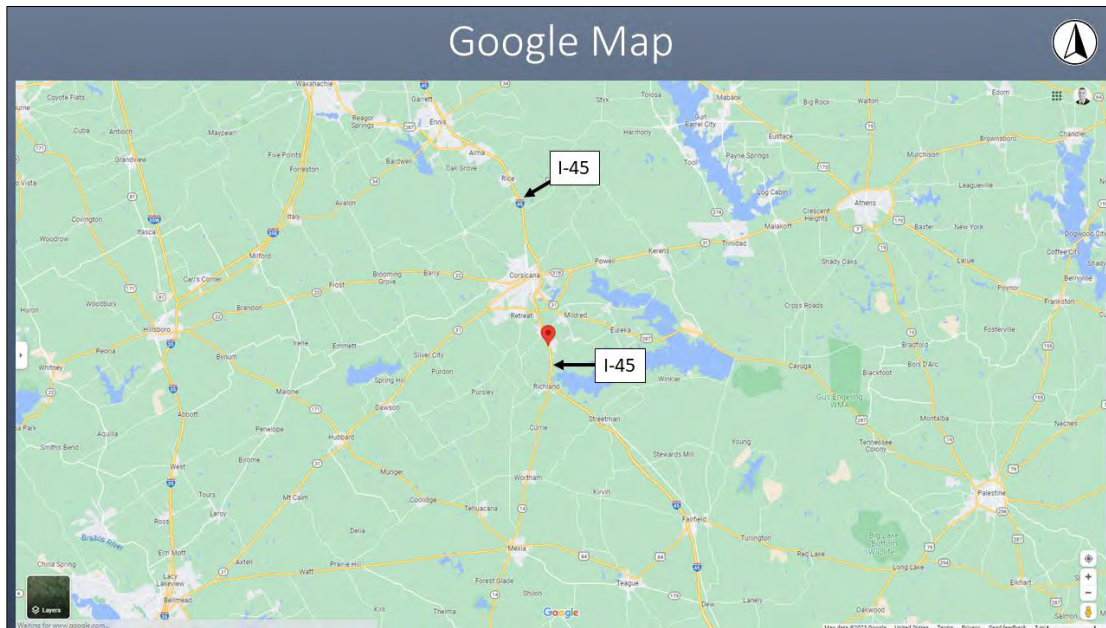


Figure 5: Google map.

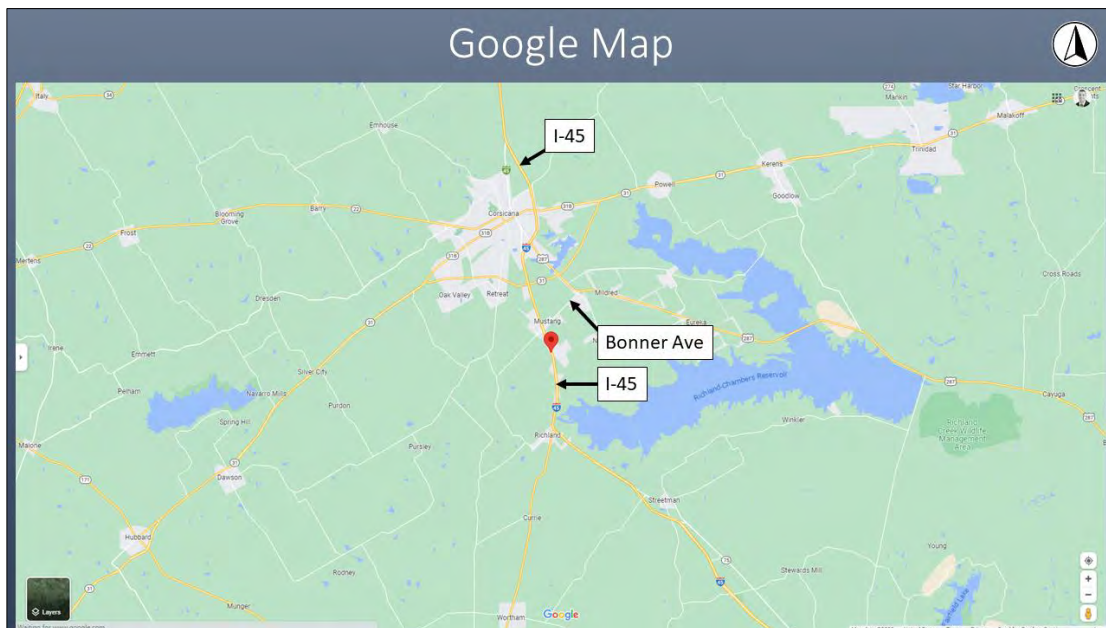


Figure 6: Google map.



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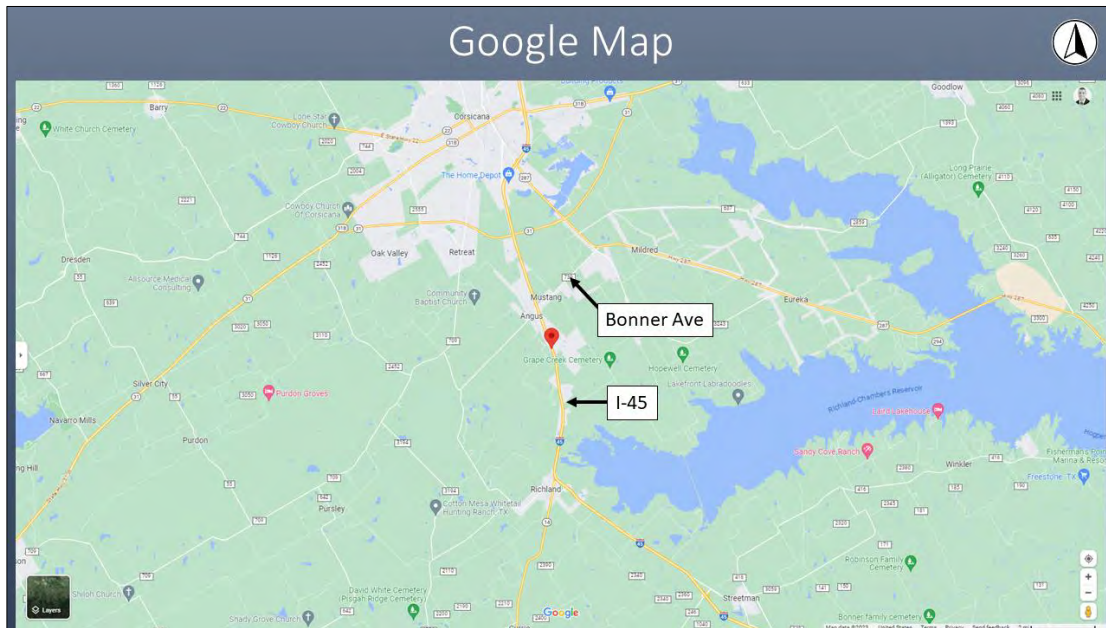


Figure 7: Google map.

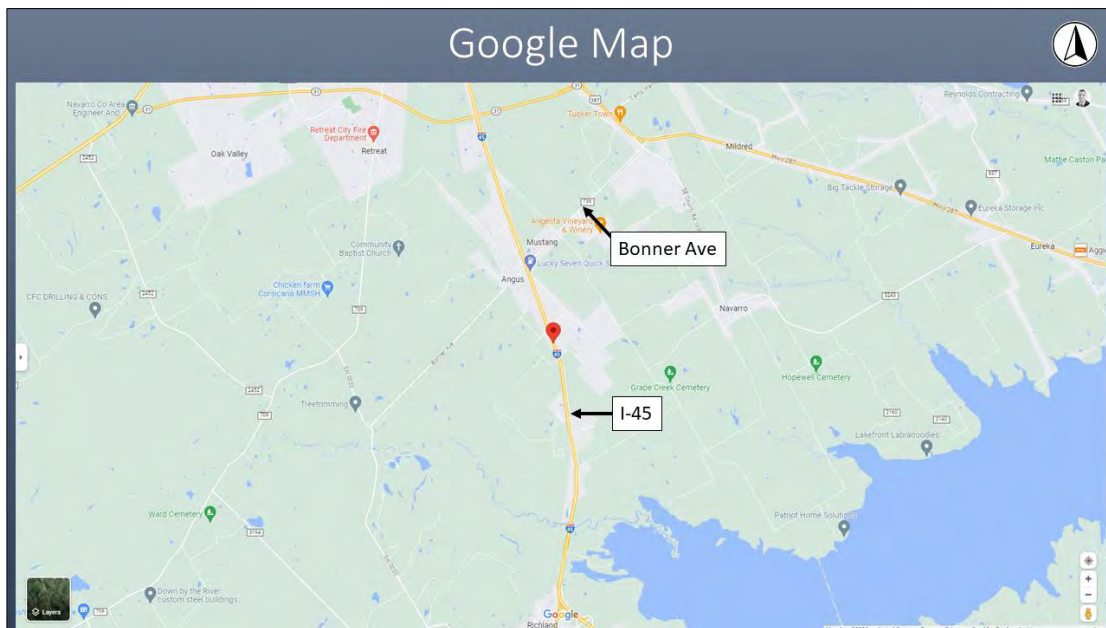


Figure 8: Google map.

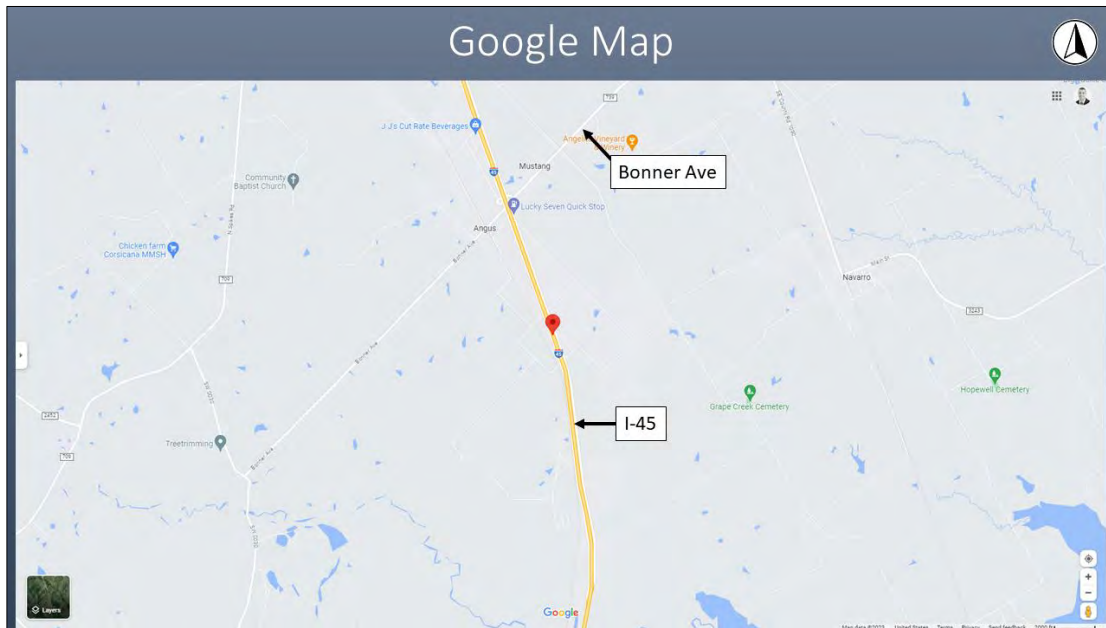


Figure 9: Google map.



Figure 10: Google aerial.



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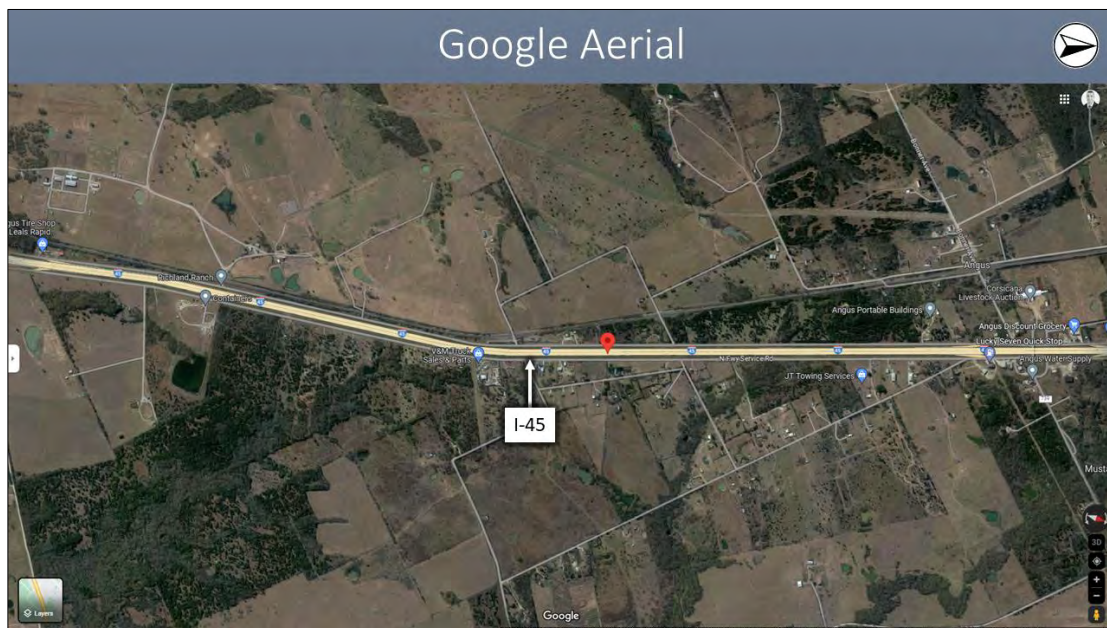


Figure 11: Google aerial.

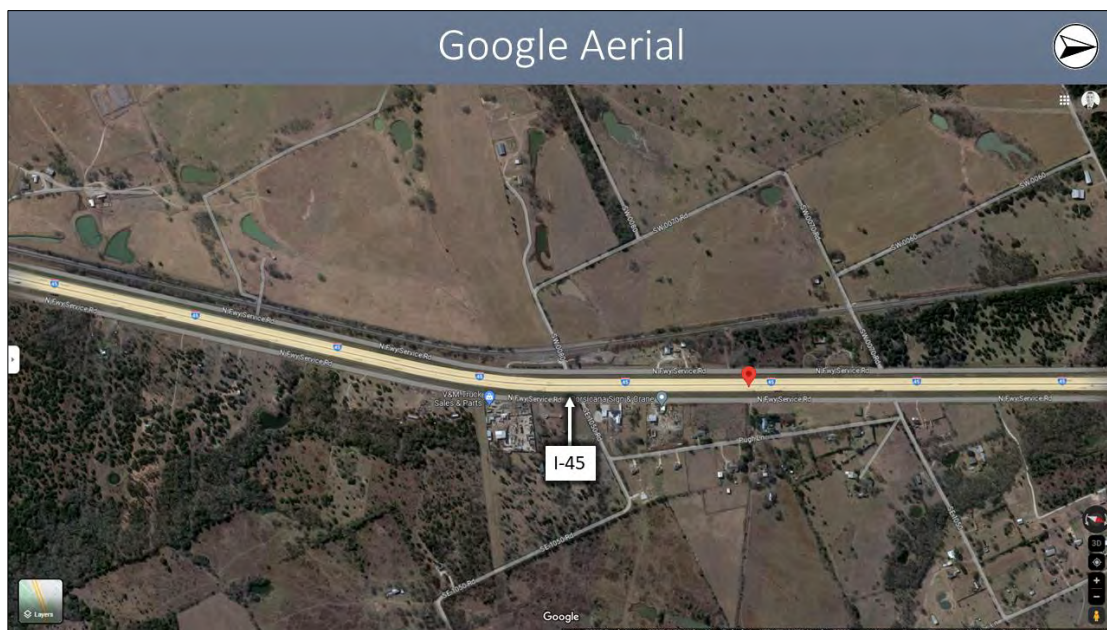


Figure 12: Google aerial.



Figure 13: Google aerial.



Figure 14: Google aerial.



Figure 15: Google aerial.



Figure 16: Google aerial.



Figure 17: Roadway curvature.

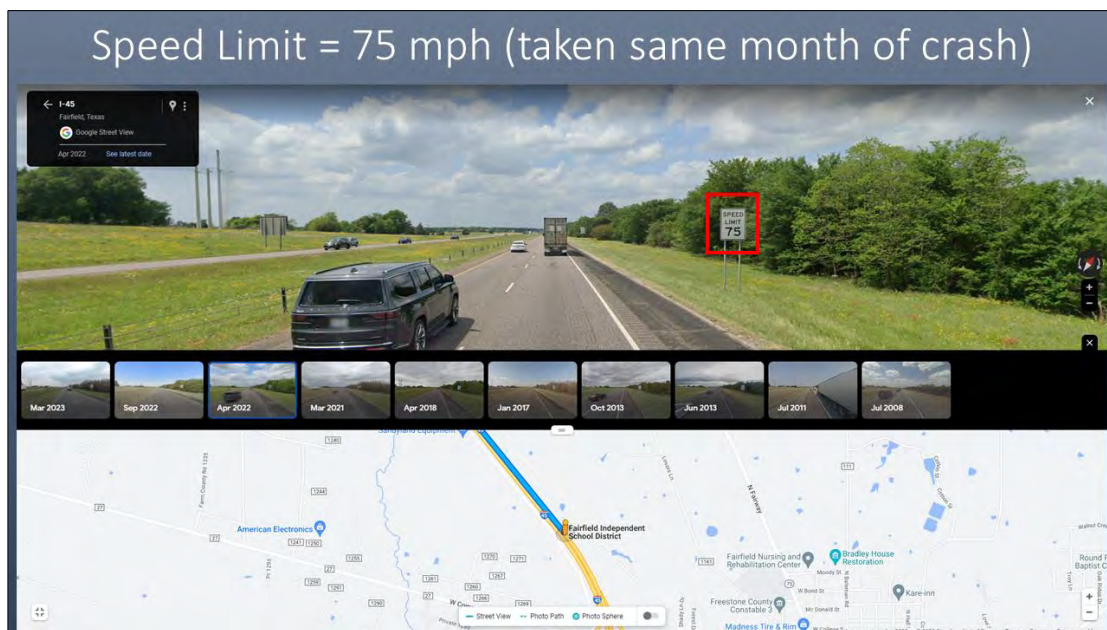


Figure 18: Speed limit 75 mph.



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Figure 19: CAC site inspection photograph taken on 04/26/2023.



Figure 20: CAC site inspection photograph taken on 04/26/2023.



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Figure 21: CAC site inspection drone mapping performed on 04/26/2023.



Figure 22: Historical Google Aerial dated January of 2022.



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Figure 23: Historical Google Aerial dated June of 2022.



Figure 24: Historical aerial flyover image taken on 11/28/2022.



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Figure 25: Historical Google Street View taken 1 month after crash.



Figure 26: Historical Google Street View taken 1 month after crash.



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Figure 27: Historical Google Street View taken 1 month after crash.



Figure 28: Historical Google Street View taken 1 month after crash.



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Figure 29: Historical Google Street View taken 1 month after crash.



Figure 30: Historical Google Street View taken 1 month after crash.



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Figure 31: Historical Google Street View taken 1 month after crash.



Figure 32: Historical Google Street View taken 1 month after crash.



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Figure 33: Historical Google Street View taken 1 month after crash.



Figure 34: Historical Google Street View taken 1 month after crash.



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Figure 35: Historical Google Street View taken 1 month after crash.



Figure 36: Historical Google Street View taken 1 month after crash.



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Figure 37: Historical Google Street View taken 1 month after crash.



Figure 38: Historical Google Street View taken 1 month after crash.



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Figure 39: Historical Google Street View taken 1 month after crash.



Figure 40: Historical Google Street View taken 1 month after crash.



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Figure 41: Historical Google Street View taken 1 month after crash.

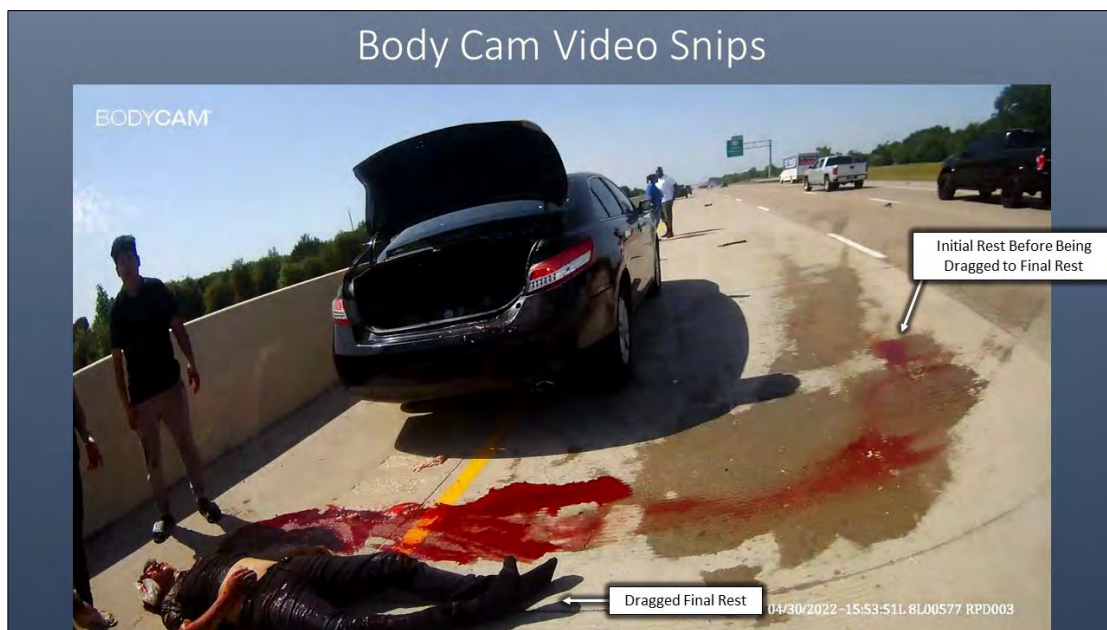


Figure 42: Body camera snips.



Figure 43: Body camera snips.



Figure 44: Police photographs.



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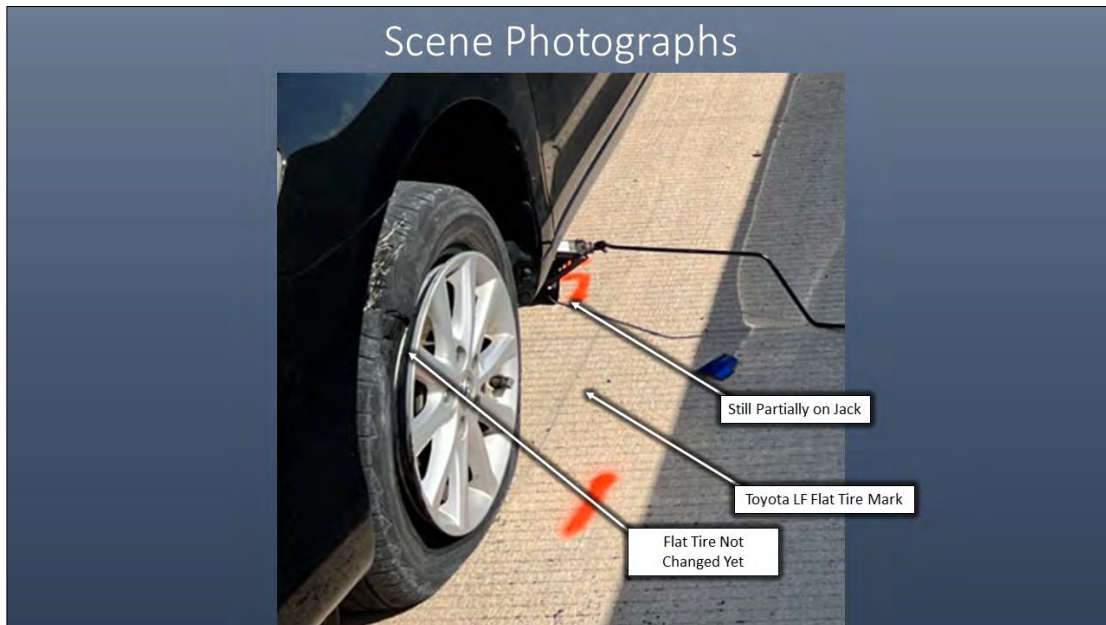


Figure 45: Police photographs.



Figure 46: Police photographs.



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Figure 47: Police photographs.



Figure 48: Police photographs.



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Figure 49: Start of officer marked Toyota left front tire mark.



Figure 50: Police photographs.



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Figure 51: Police photographs.



Figure 52: Police photographs.



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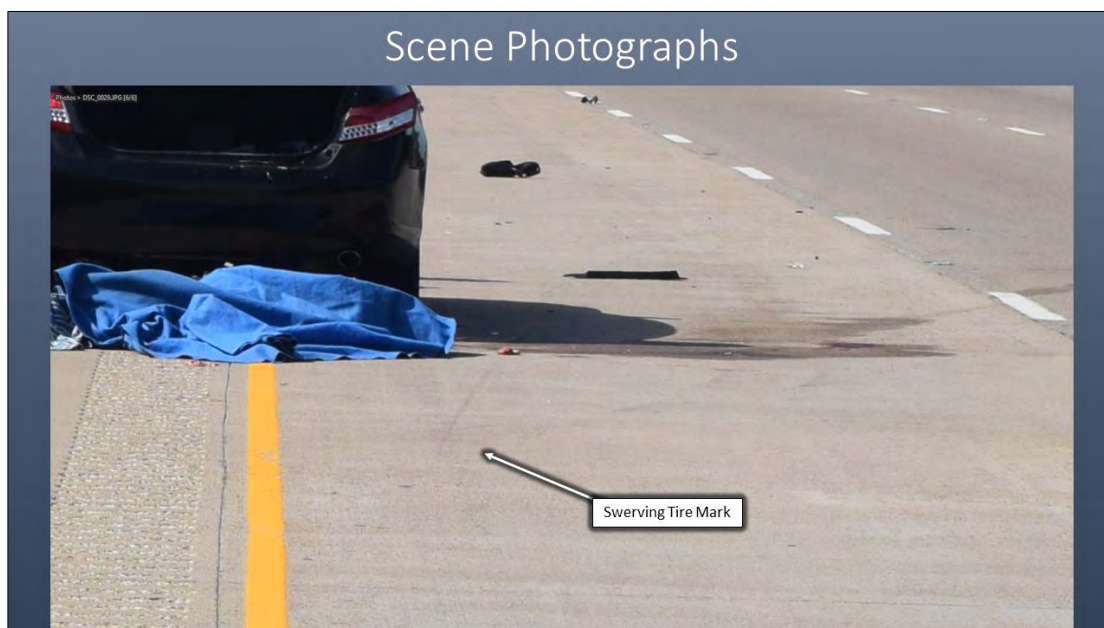


Figure 53: Police photographs.

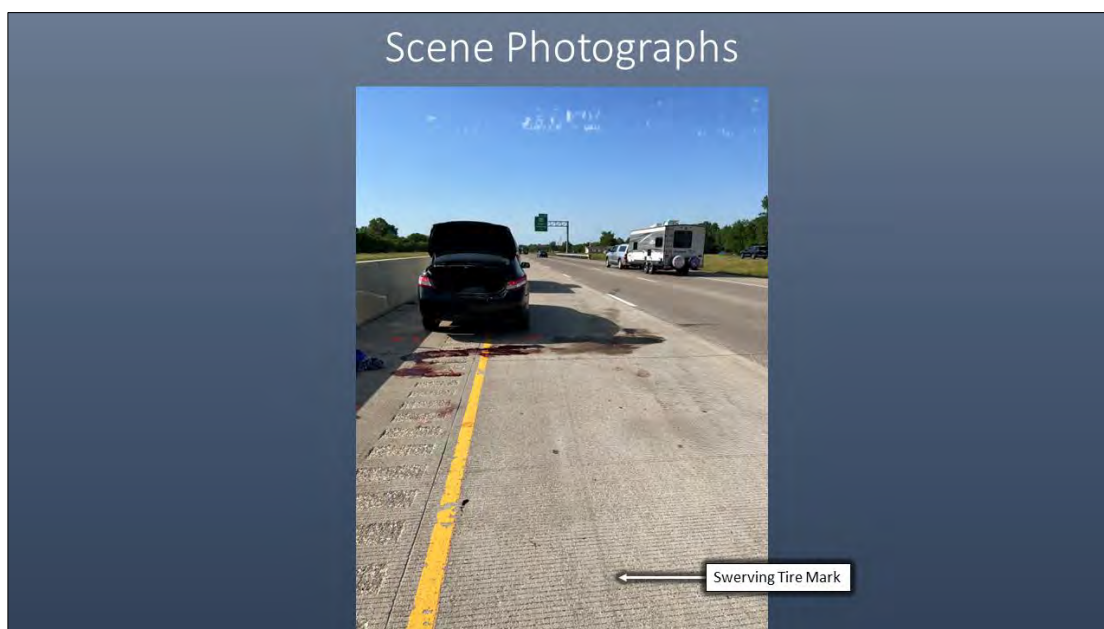


Figure 54: Police photographs.



Figure 55: Police photographs.

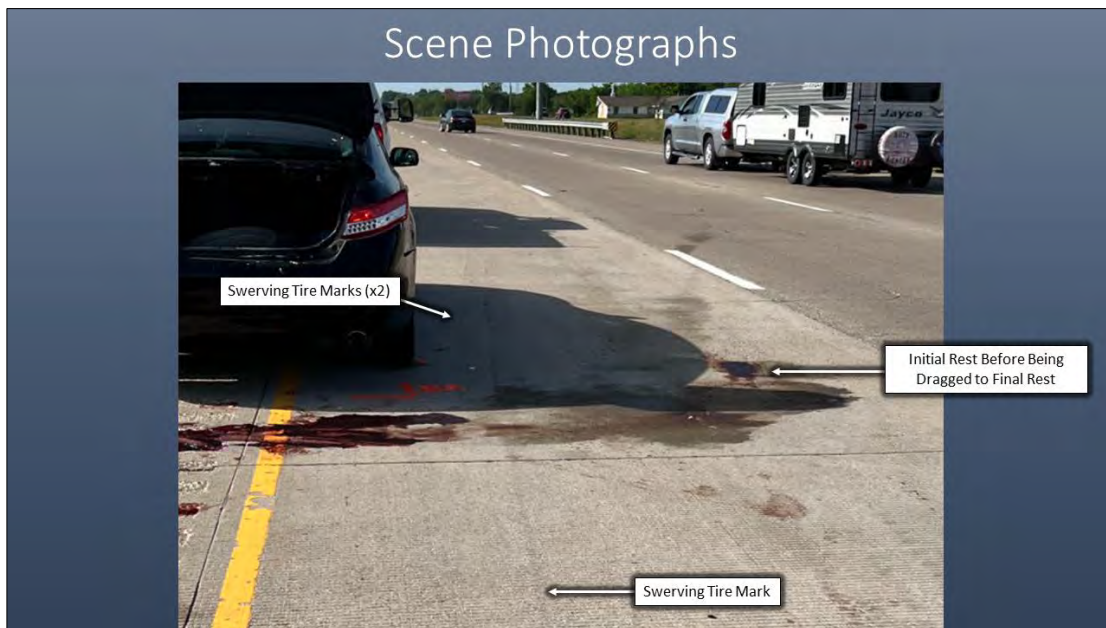


Figure 56: Police photographs.



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Figure 57: Police photographs.

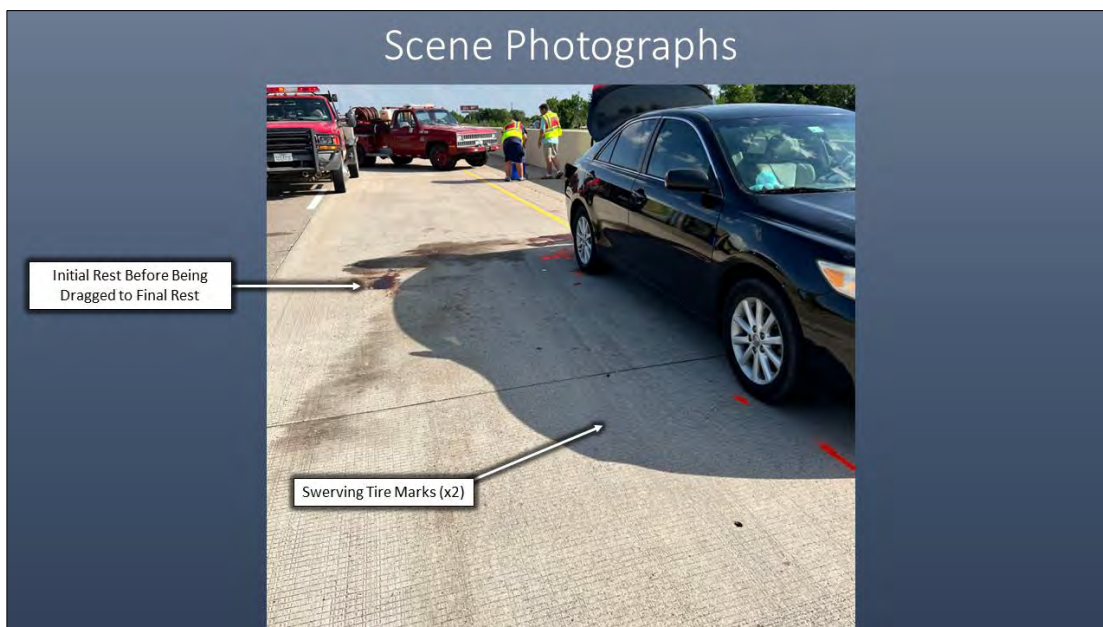


Figure 58: Police photographs.



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Figure 59: Police photographs.

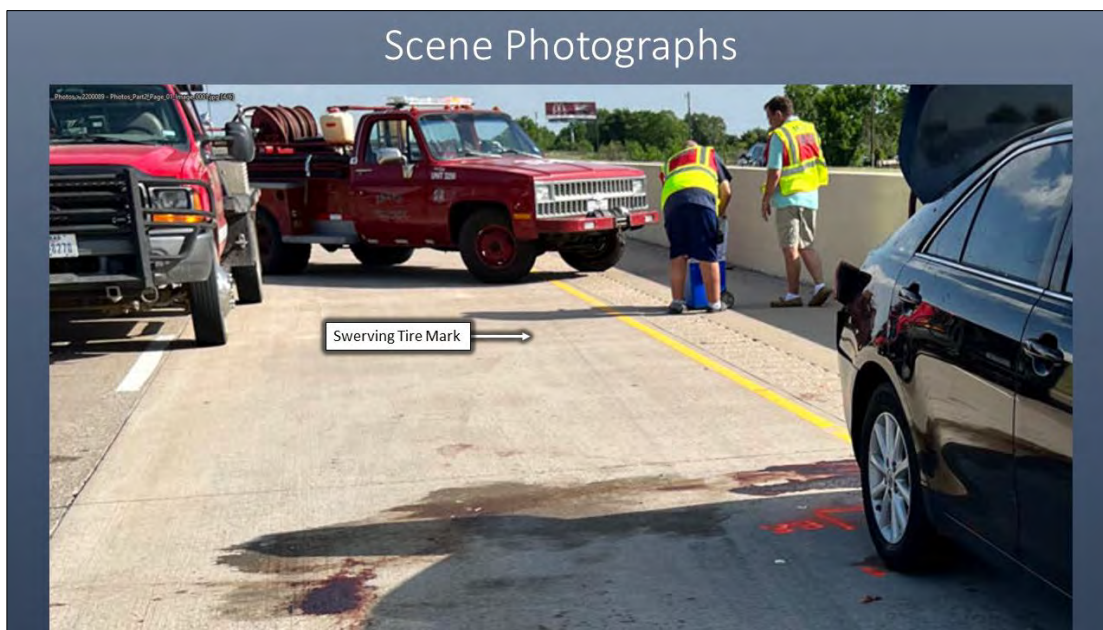


Figure 60: Police photographs.



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Figure 61: Police photographs.



Figure 62: Police photographs.



Figure 63: Police photographs – enhanced contrast.

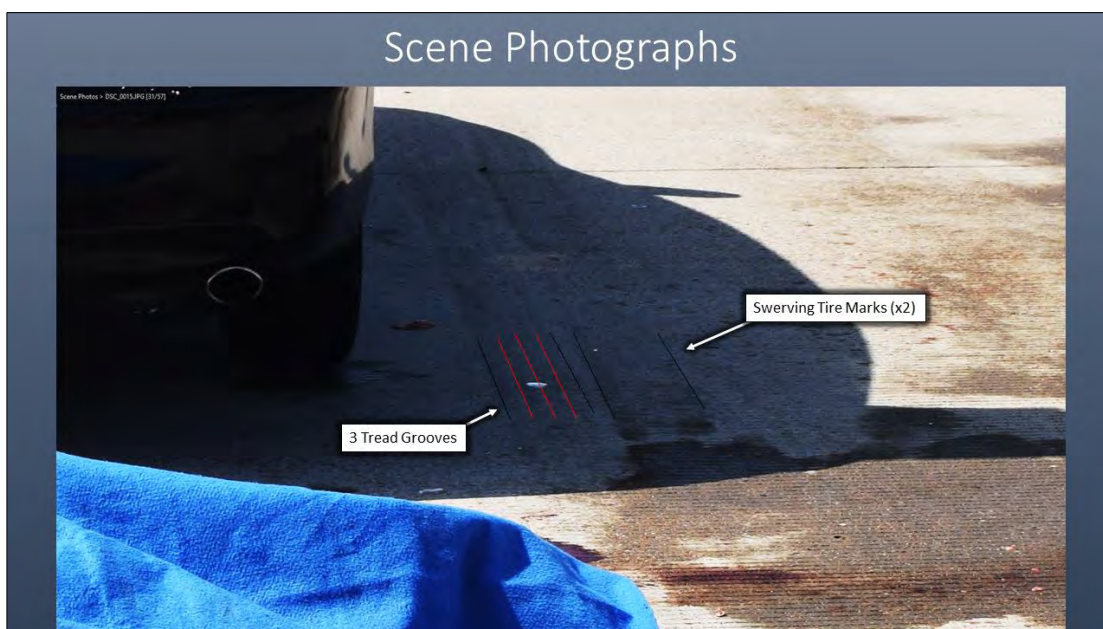


Figure 64: Police photographs.



Figure 65: Ford damage.

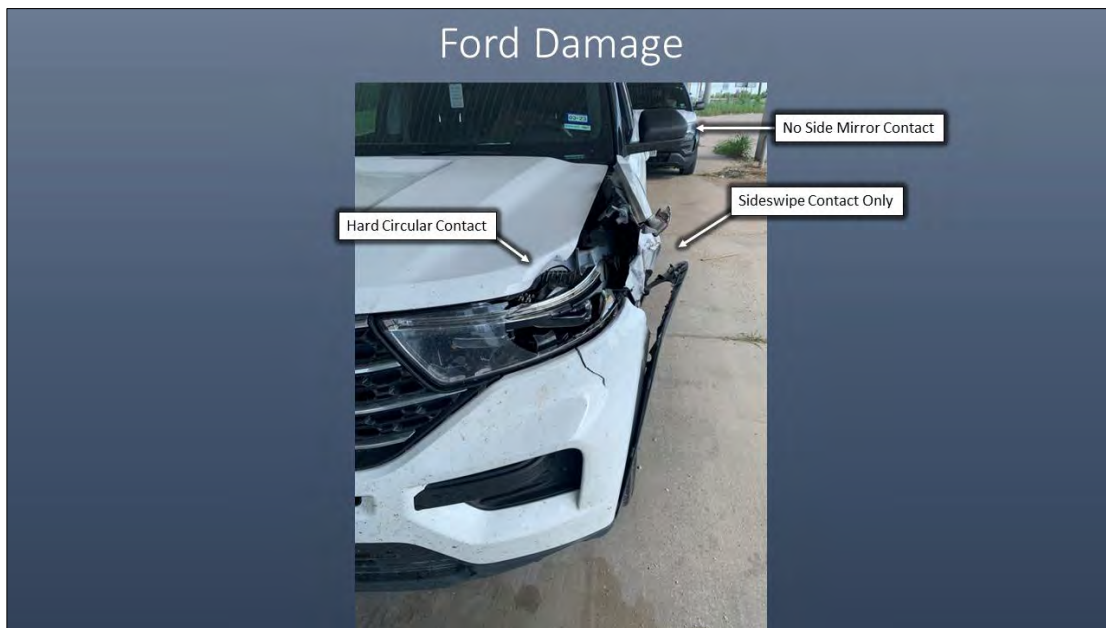


Figure 66: Ford damage.

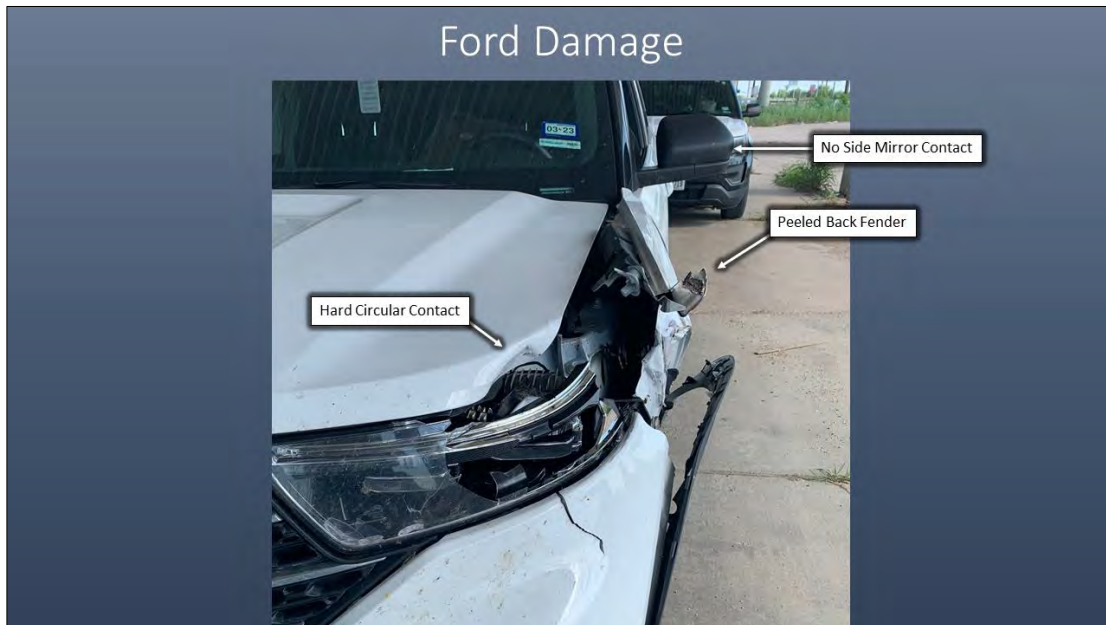


Figure 67: Ford damage.

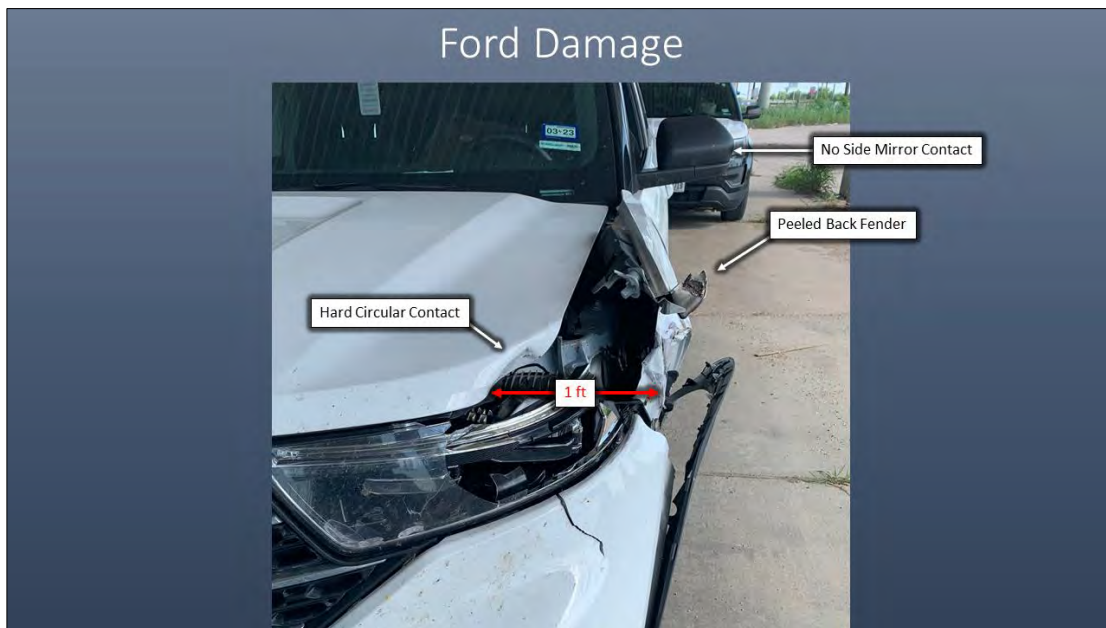


Figure 68: Contact depth = 1 foot from the left side of the Ford.



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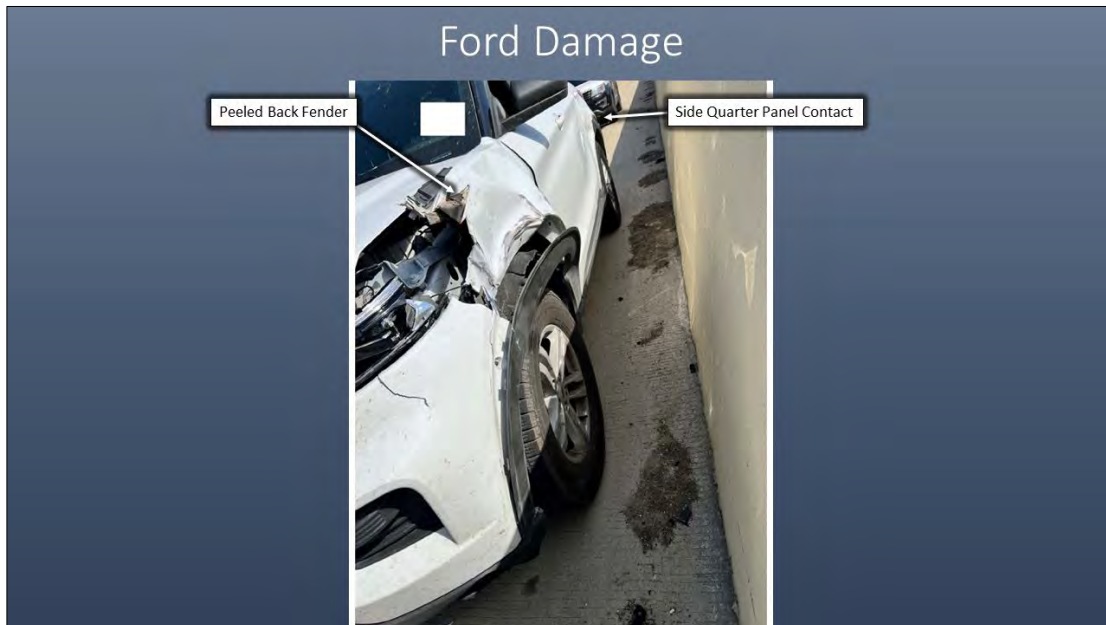


Figure 69: Ford damage.



Figure 70: Ford damage.

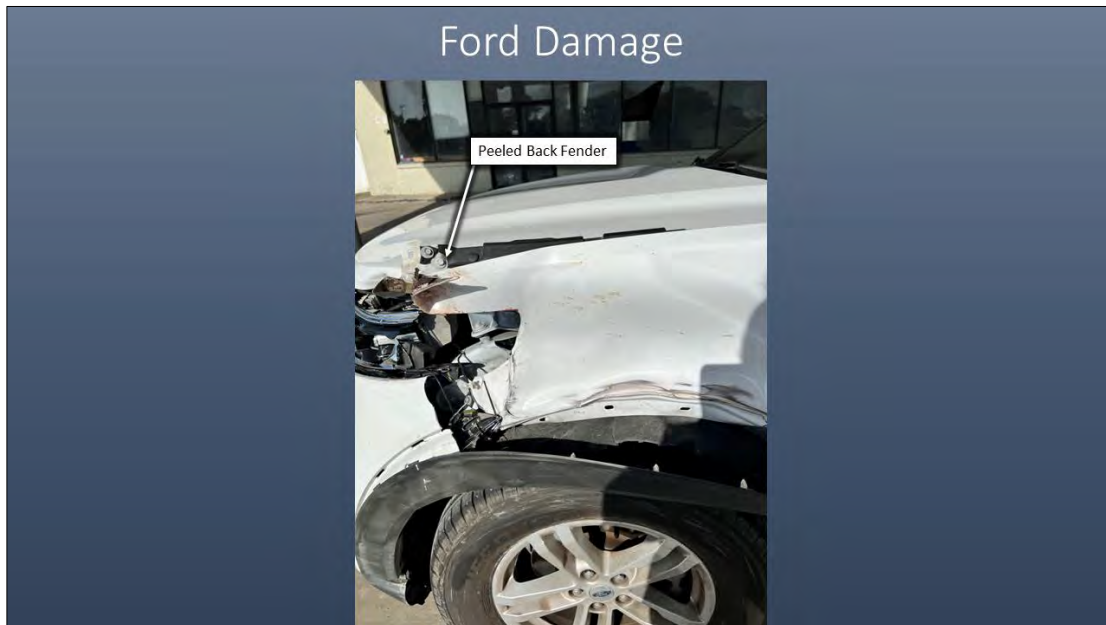


Figure 71: Ford damage.

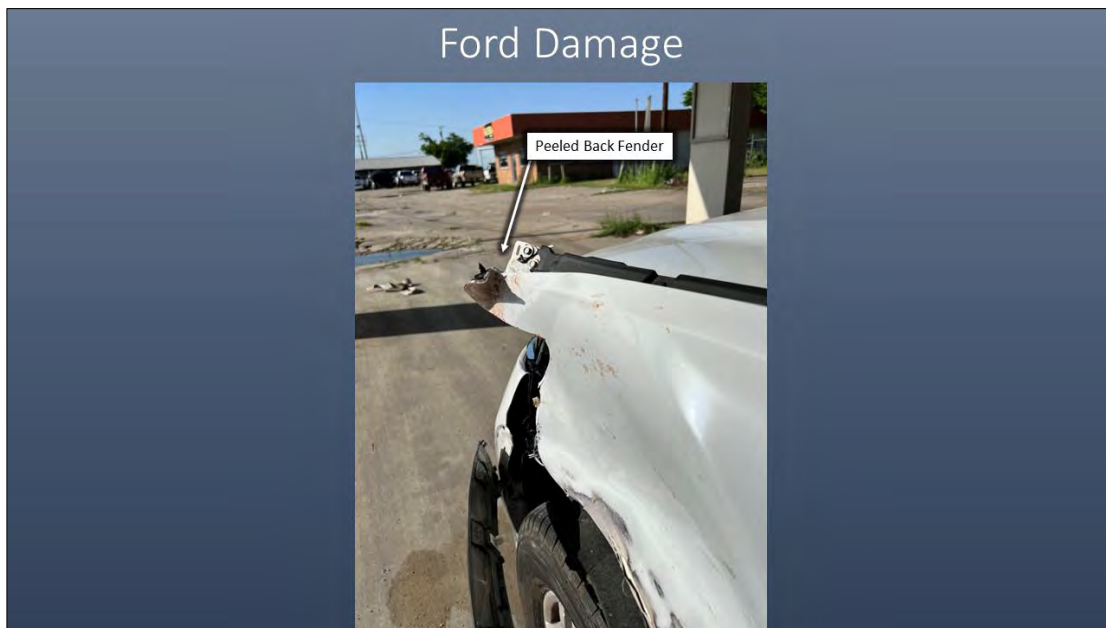


Figure 72: Ford damage.

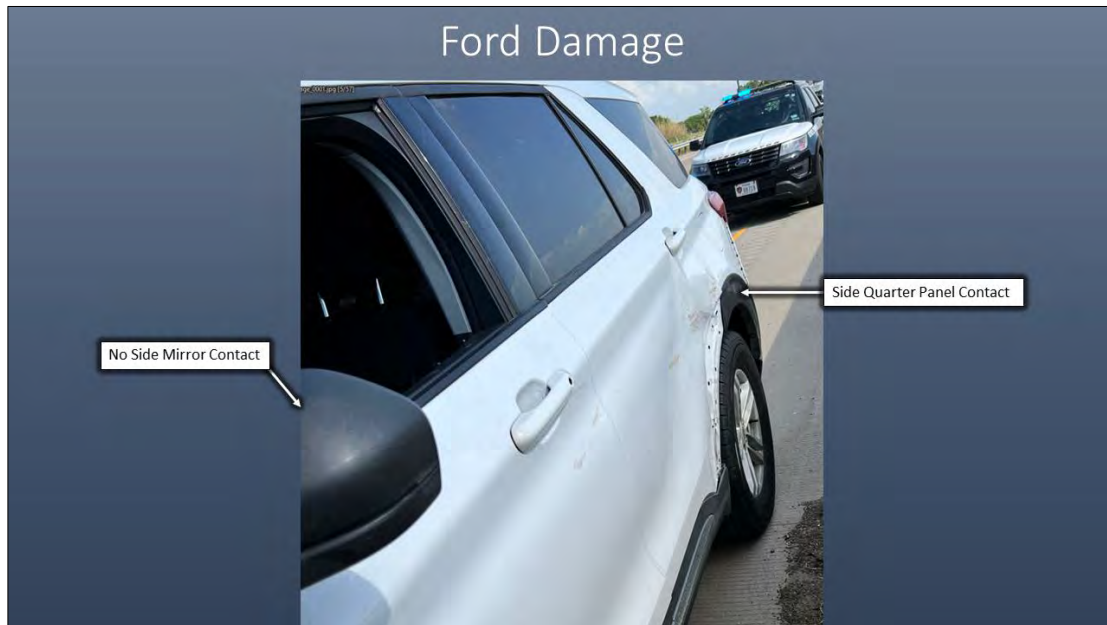


Figure 73: Ford damage.

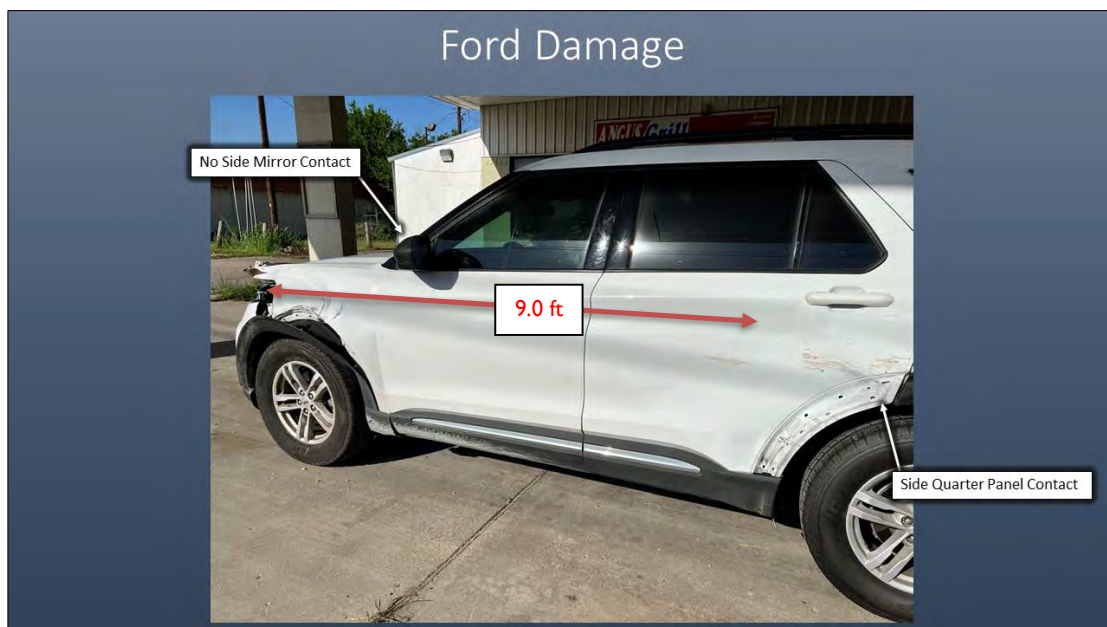


Figure 74: Ford damage – Gap in damage of approximately 9.0 feet.

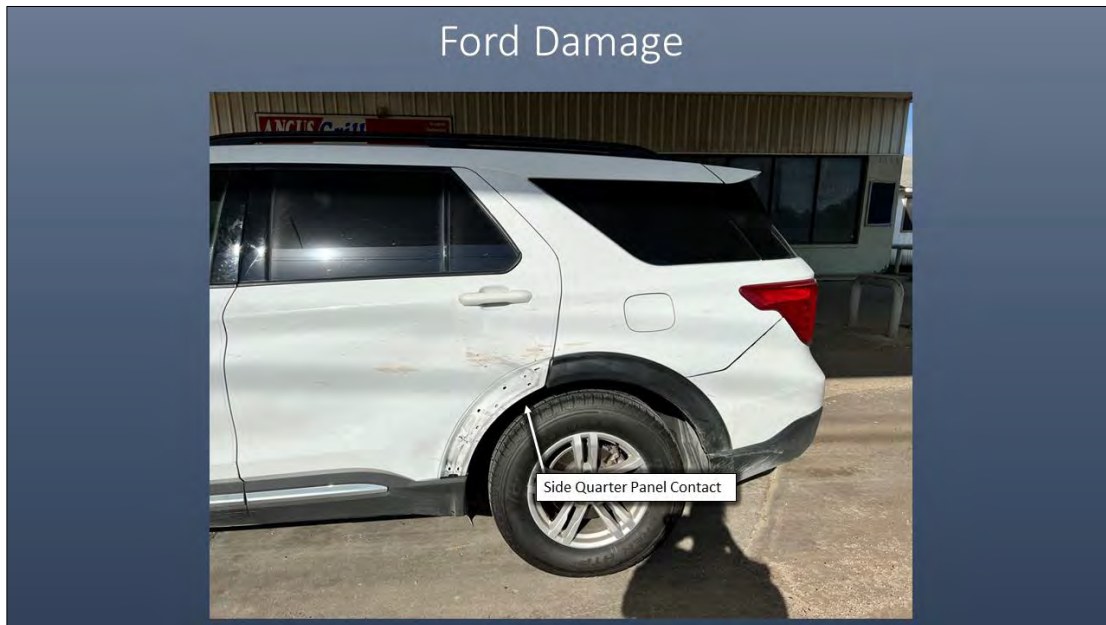


Figure 75: Ford damage.



Figure 76: Ford damage.



Figure 77: Ford damage.

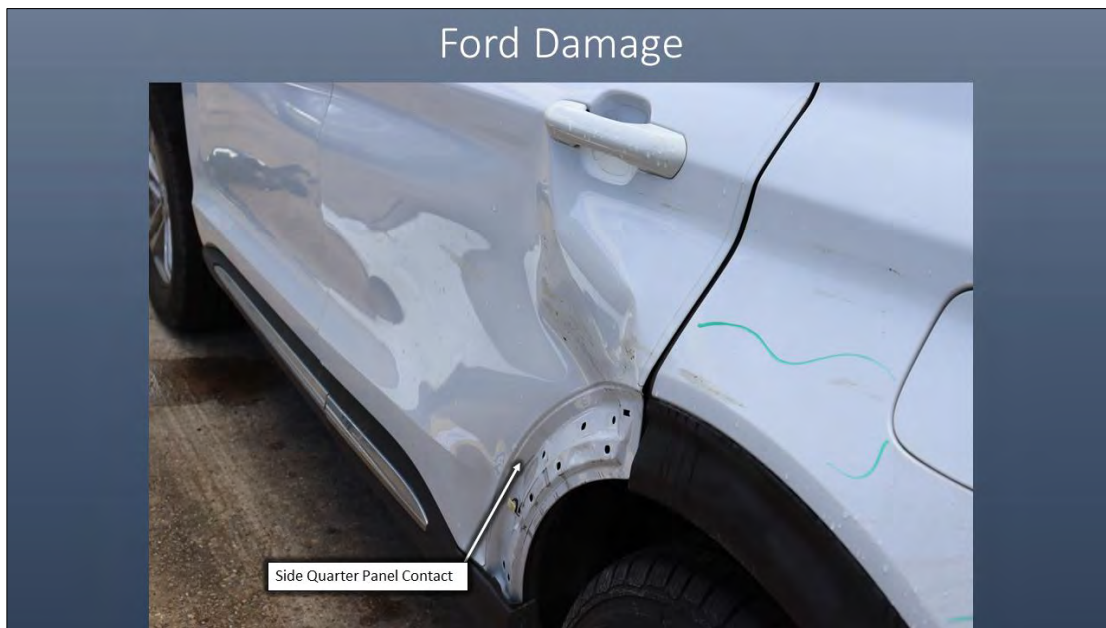


Figure 78: Ford damage.

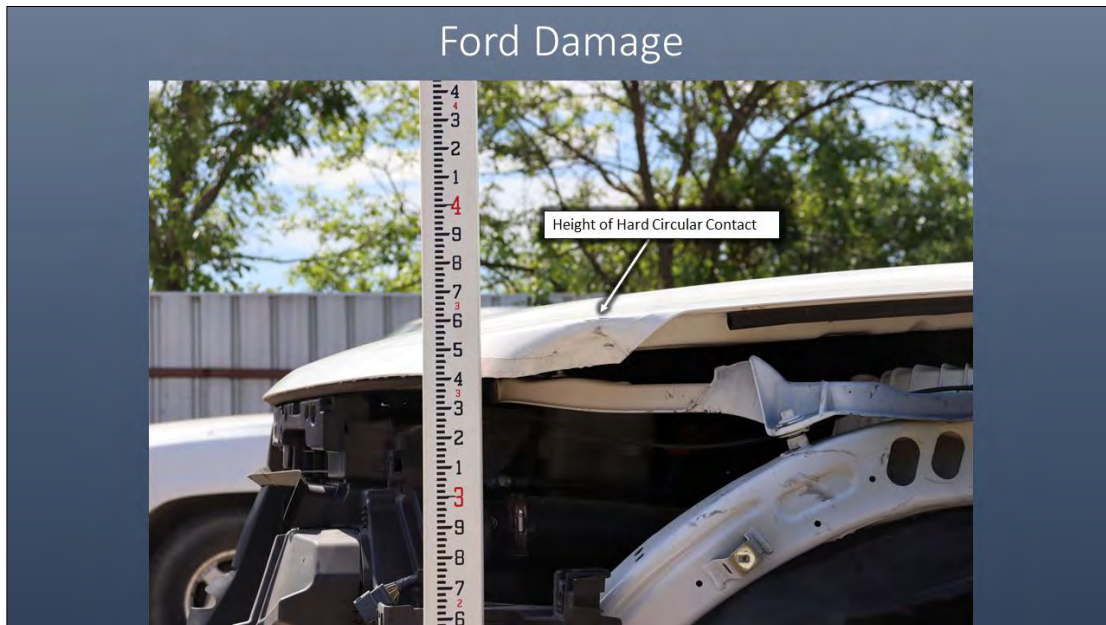


Figure 79: Ford damage.



Figure 80: Ford damage.



Ford Damage



Figure 81: Ford damage.

Ford Damage



Figure 82: Ford tread pattern.



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Scene Photographs



Figure 83: Body material onto Toyota.

Scene Photographs



Figure 84: Body material onto Toyota.



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Scene Photographs



Figure 85: Body material onto Toyota.

Scene Photographs



Figure 86: Body material onto Toyota.



Scene Photographs



Figure 87: Body material onto Toyota.

Scene Photographs

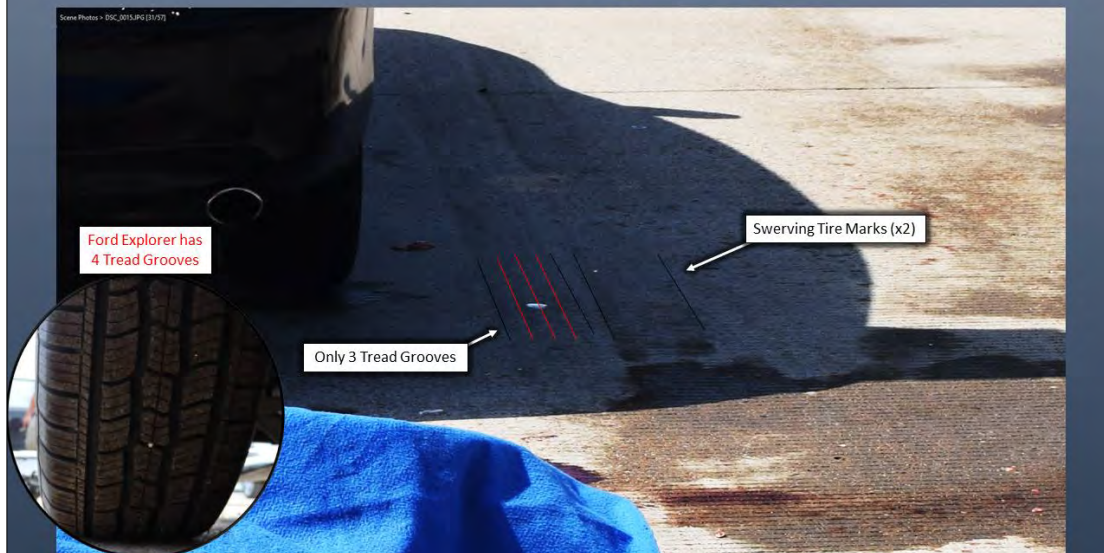


Figure 88: Police photographs comparing tread pattern.



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Graphical / Scalar Photogrammetry



Figure 89: Graphical Photogrammetry.

Graphical / Scalar Photogrammetry

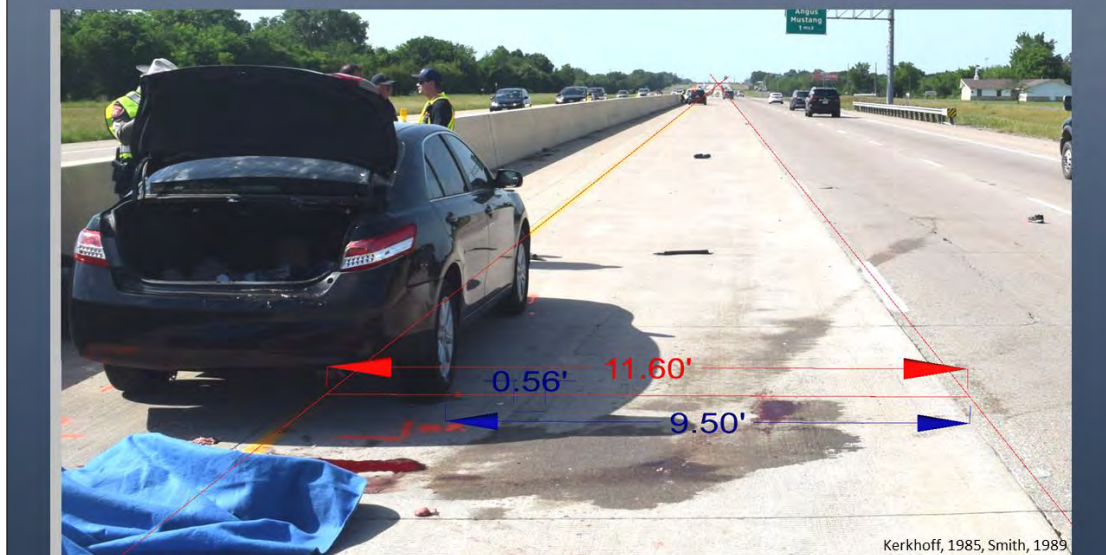


Figure 90: Scalar Photogrammetry.



Figure 91: Tire mark width with scalar photogrammetry.

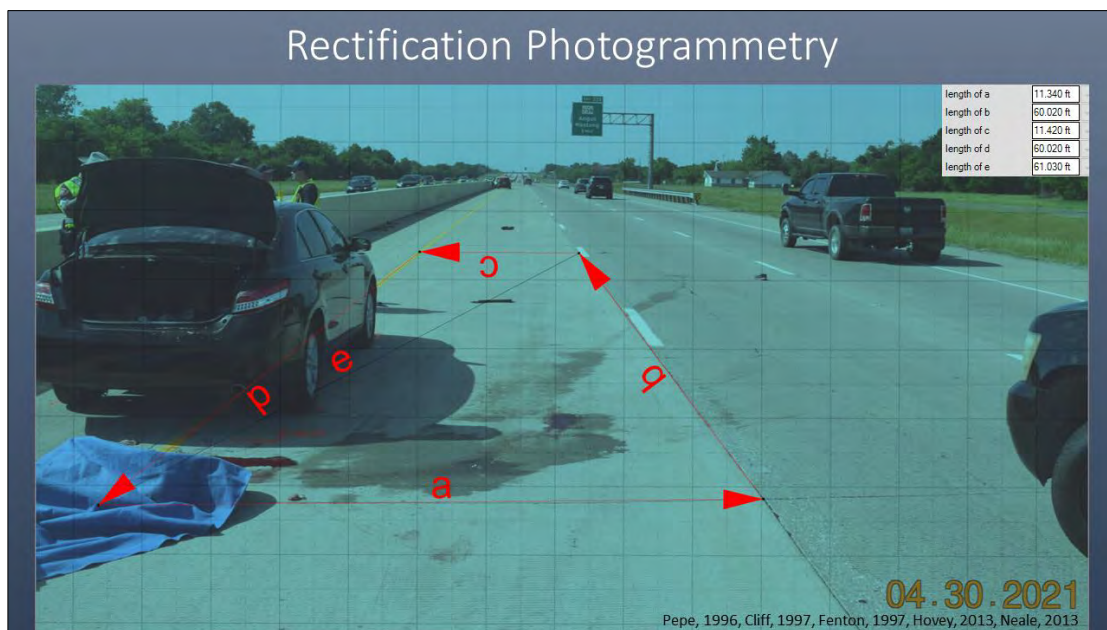


Figure 92: Rectification Photogrammetry.



Figure 93: Rectification Photogrammetry.

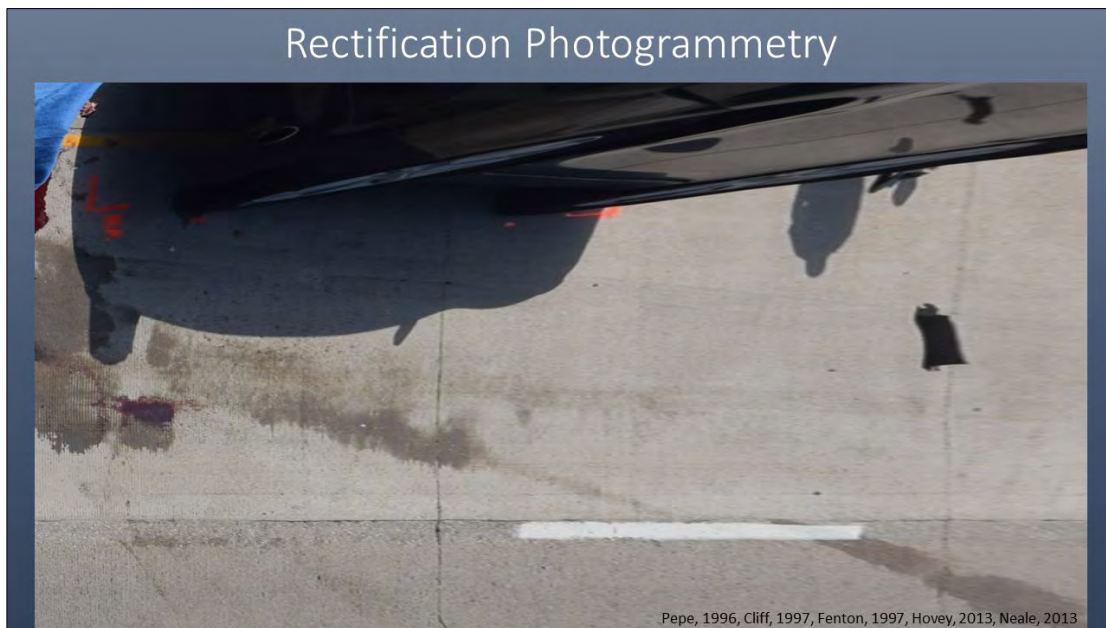


Figure 94: Rectification Photogrammetry.

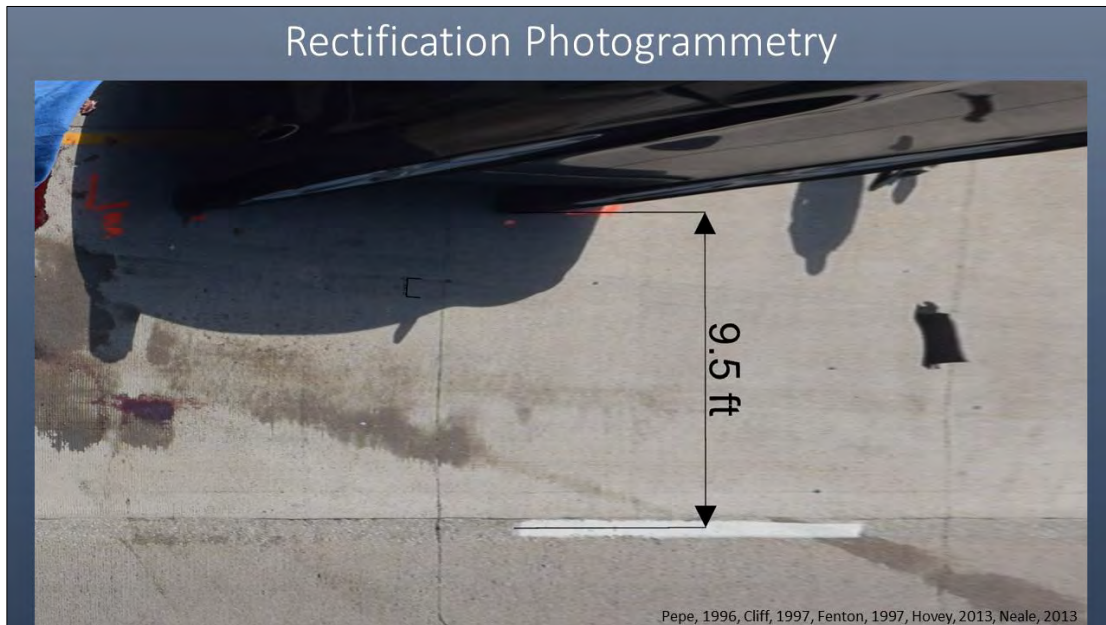


Figure 95: Rectification Photogrammetry.



Figure 96: Tire mark width with rectification photogrammetry.



Figure 97: Tire mark width with rectification photogrammetry.



Figure 98: Traditional Photogrammetry.



Figure 99: Traditional Photogrammetry.



Figure 100: Traditional Photogrammetry.



Figure 101: Traditional Photogrammetry.



Figure 102: Traditional Photogrammetry.



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Figure 103: Traditional Photogrammetry.



Figure 104: Traditional Photogrammetry.

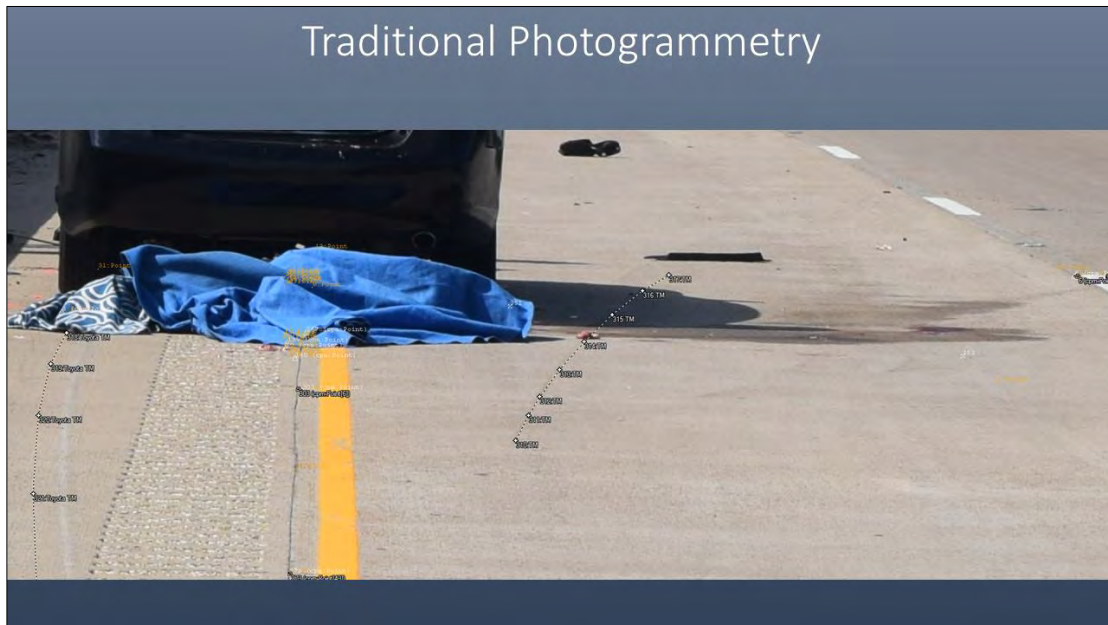


Figure 105: Traditional Photogrammetry.

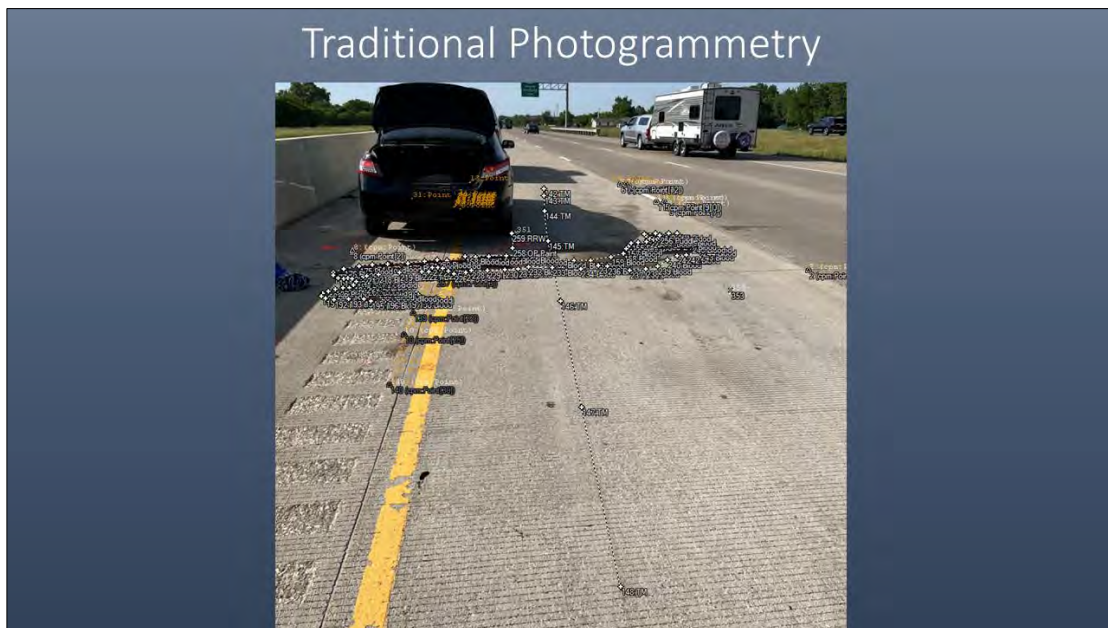


Figure 106: Traditional Photogrammetry.



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Figure 107: Traditional Photogrammetry.

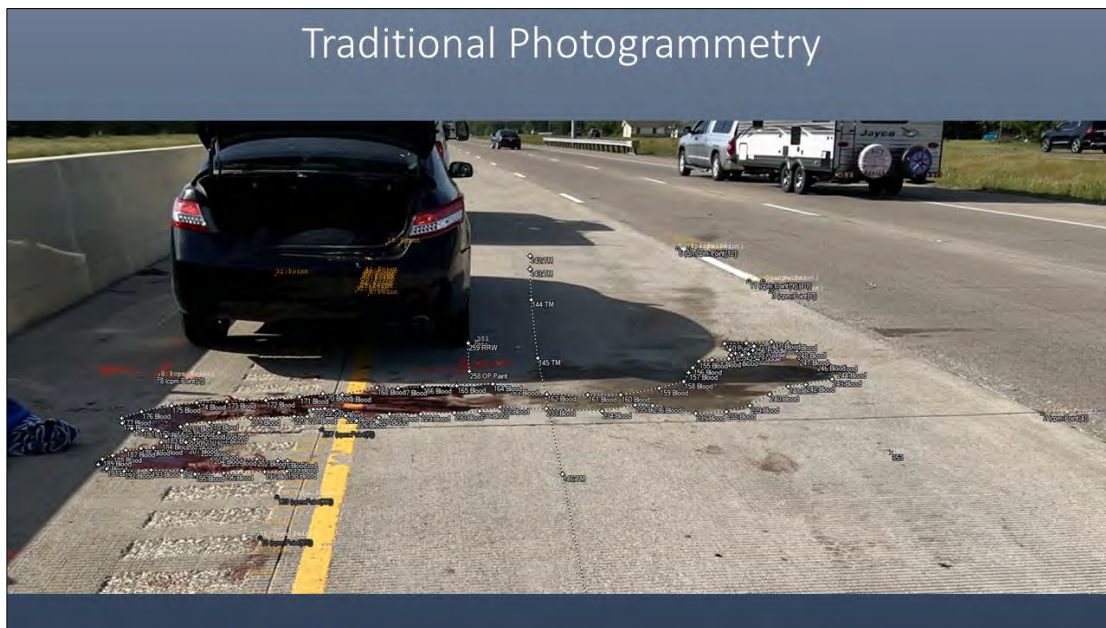


Figure 108: Traditional Photogrammetry.

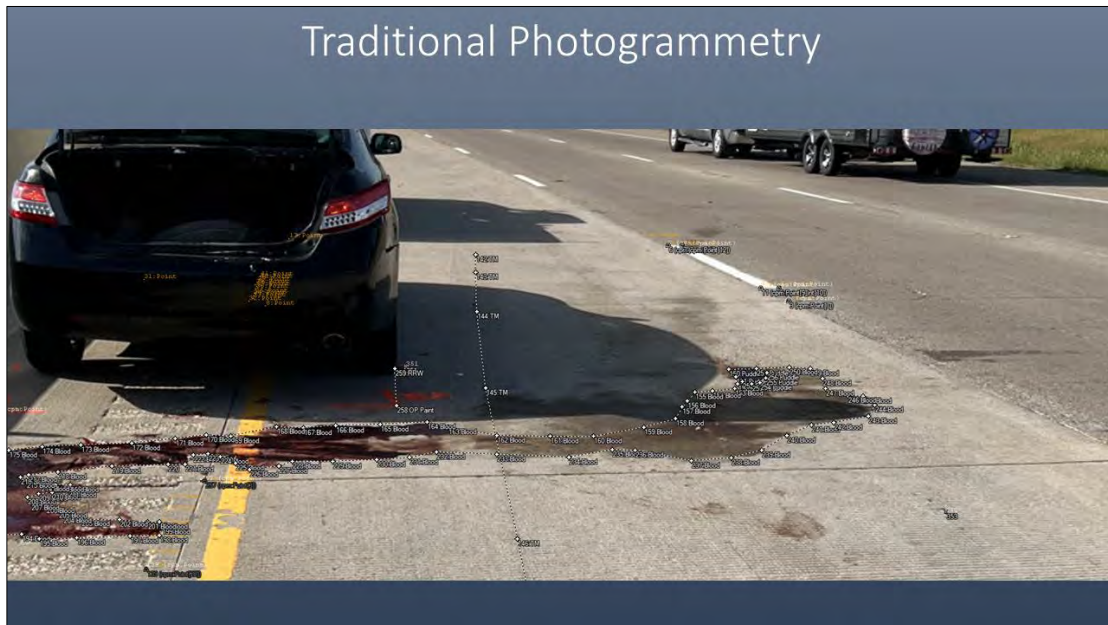


Figure 109: Traditional Photogrammetry.

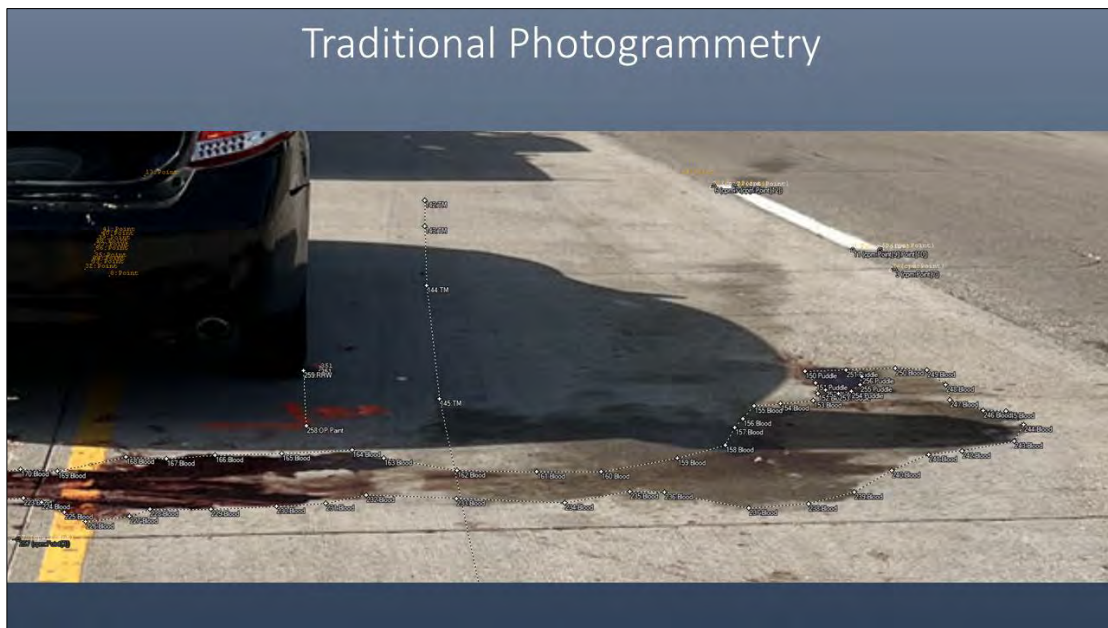


Figure 110: Traditional Photogrammetry.



Figure III: Tire mark width with traditional photogrammetry.



Figure II2: Tire mark width with traditional photogrammetry.



Figure 113: Tire mark width with traditional photogrammetry.

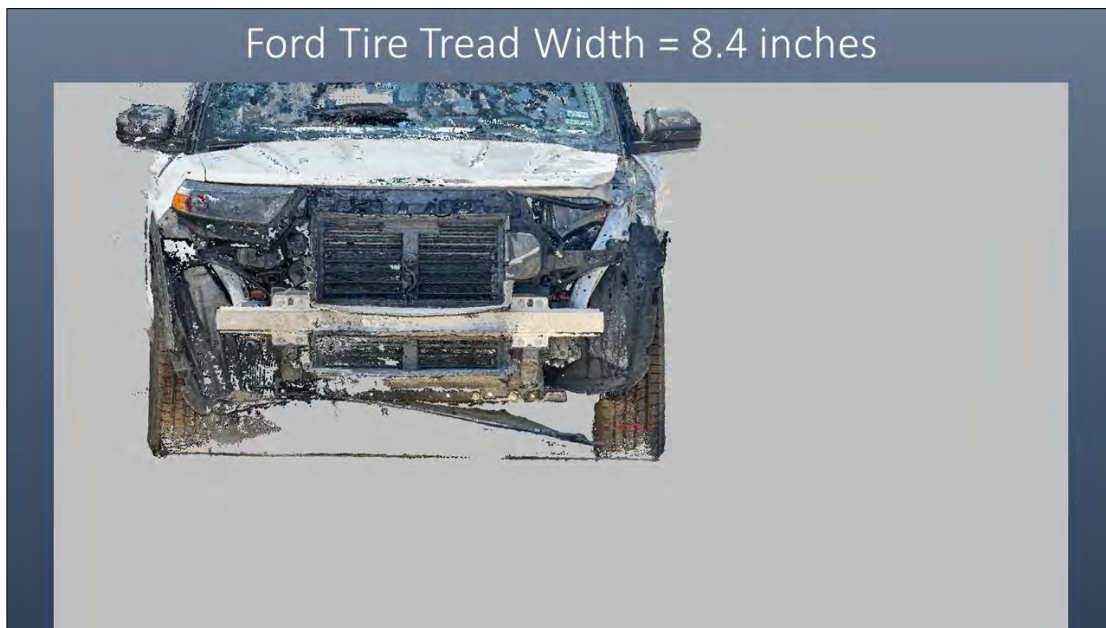


Figure 114: 3D scan of Ford and tread width.

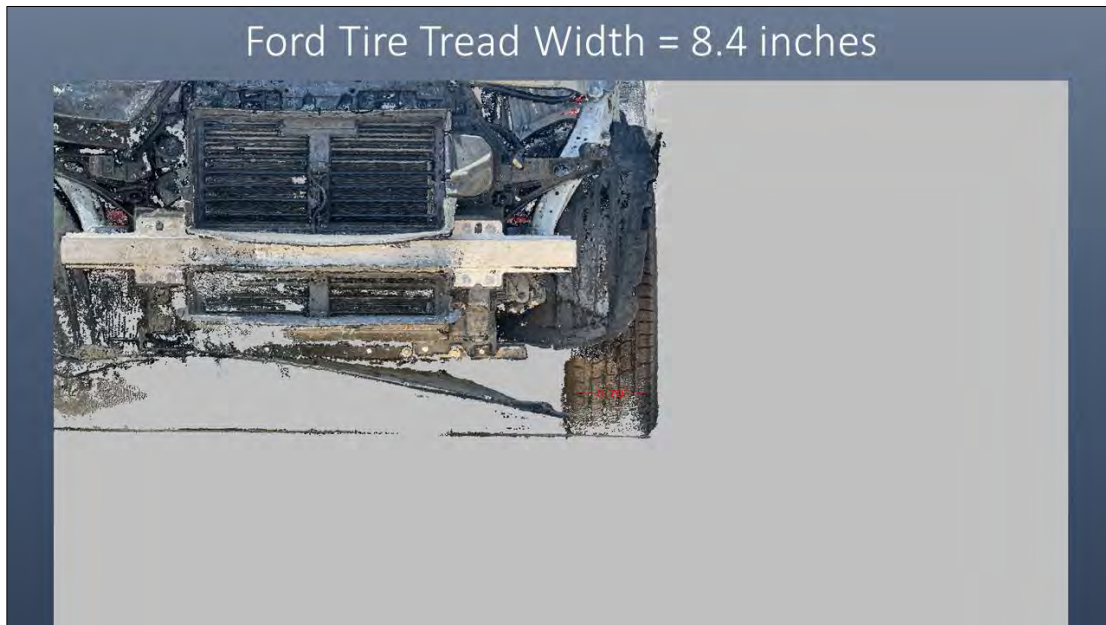


Figure 115: 3D scan of Ford and tread width.



Figure 116: 3D scan of Ford and tread width.

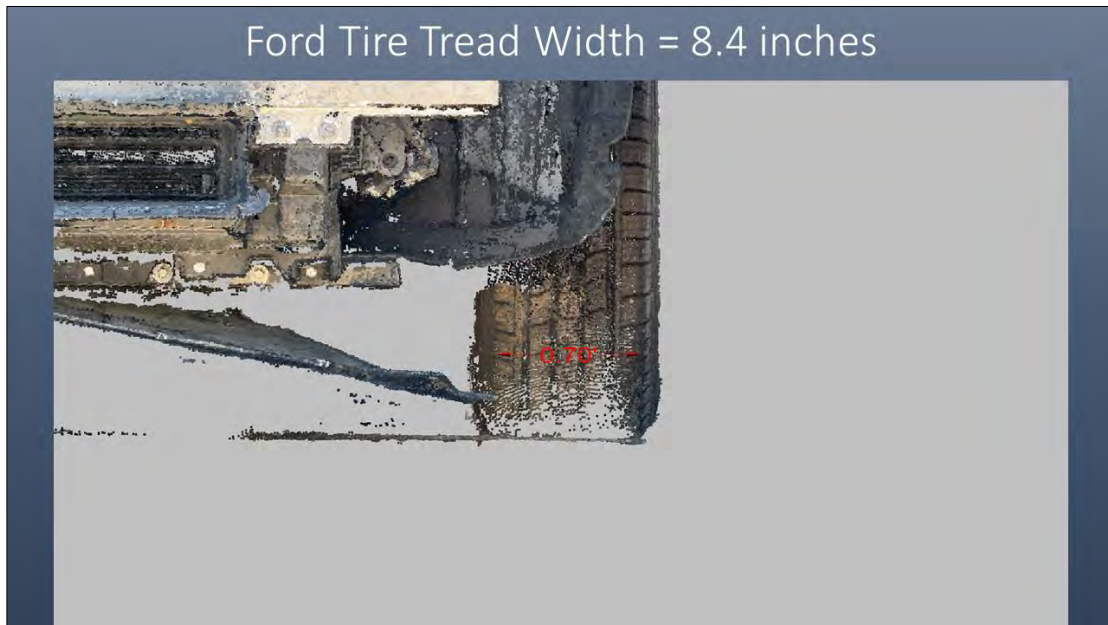


Figure 117: 3D scan of Ford and tread width.

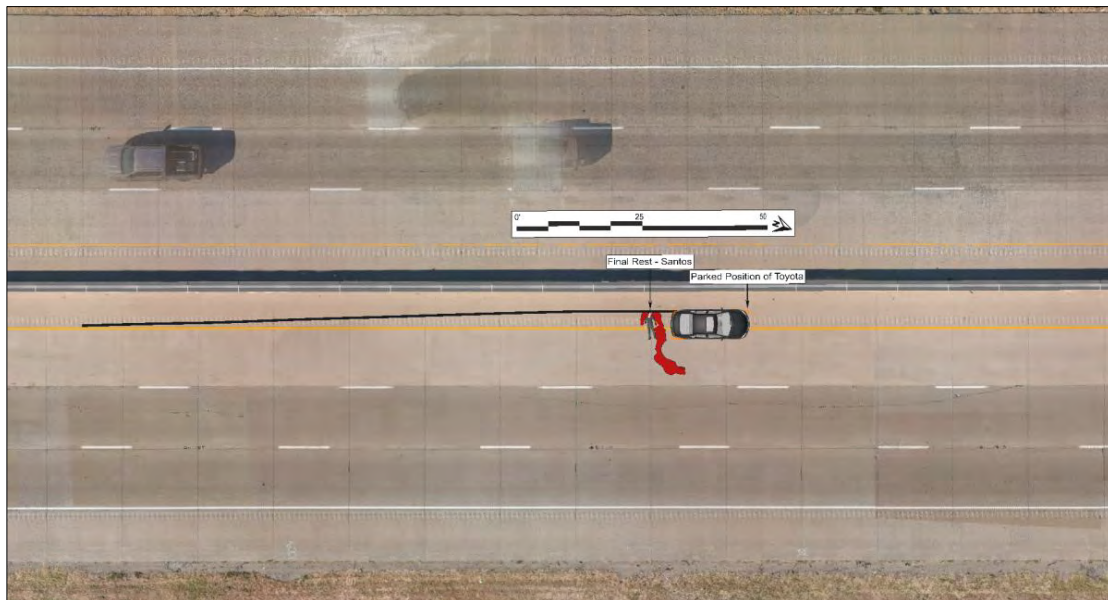


Figure 118: Scene evidence diagram.



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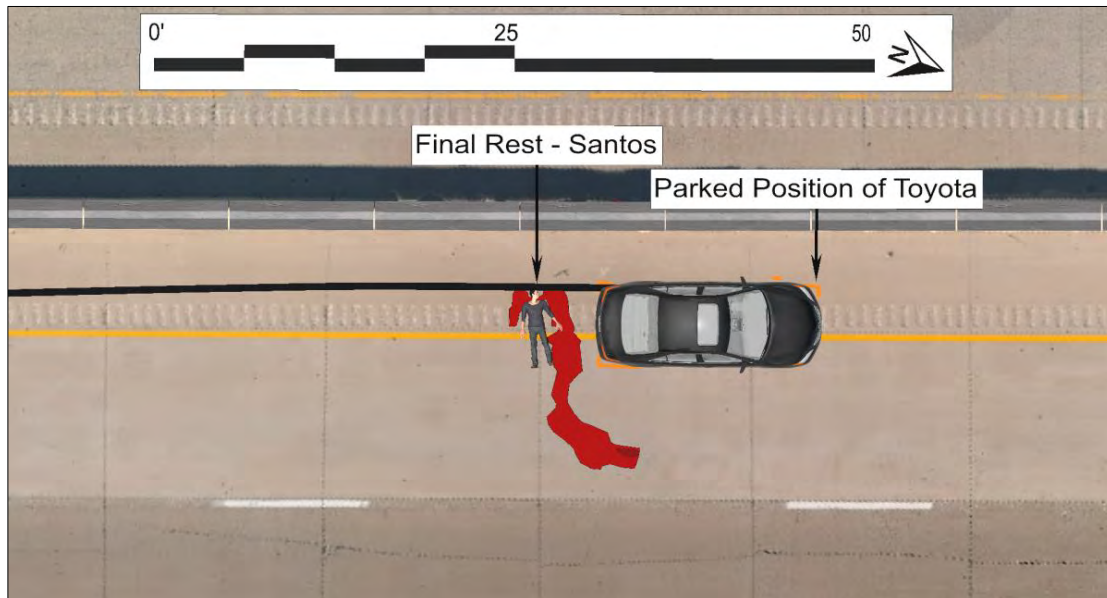


Figure 119: Scene evidence diagram.

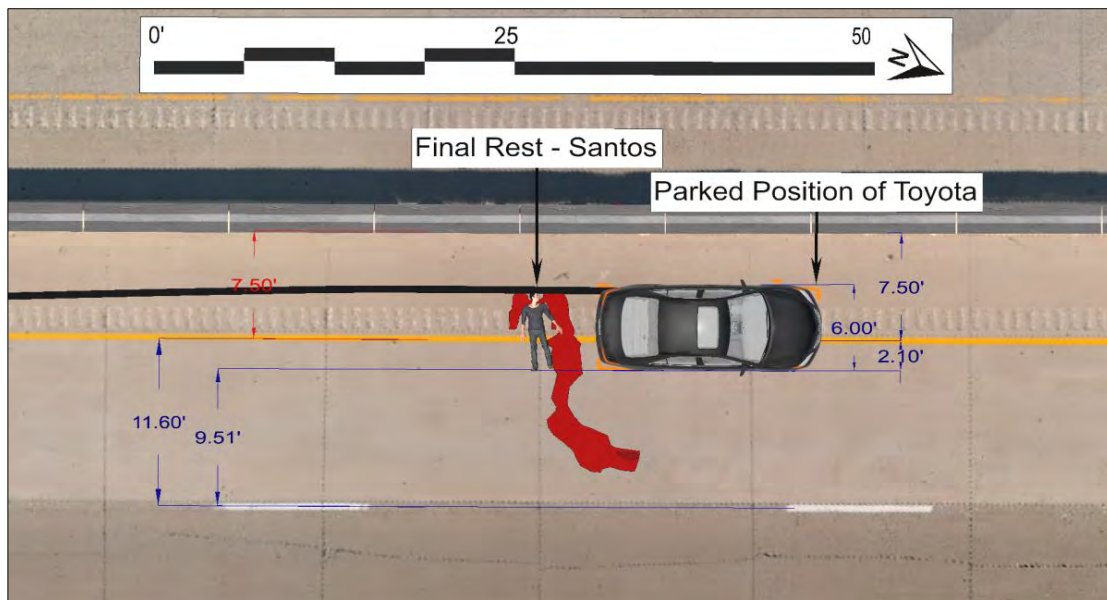


Figure 120: Scene evidence diagram measurements.



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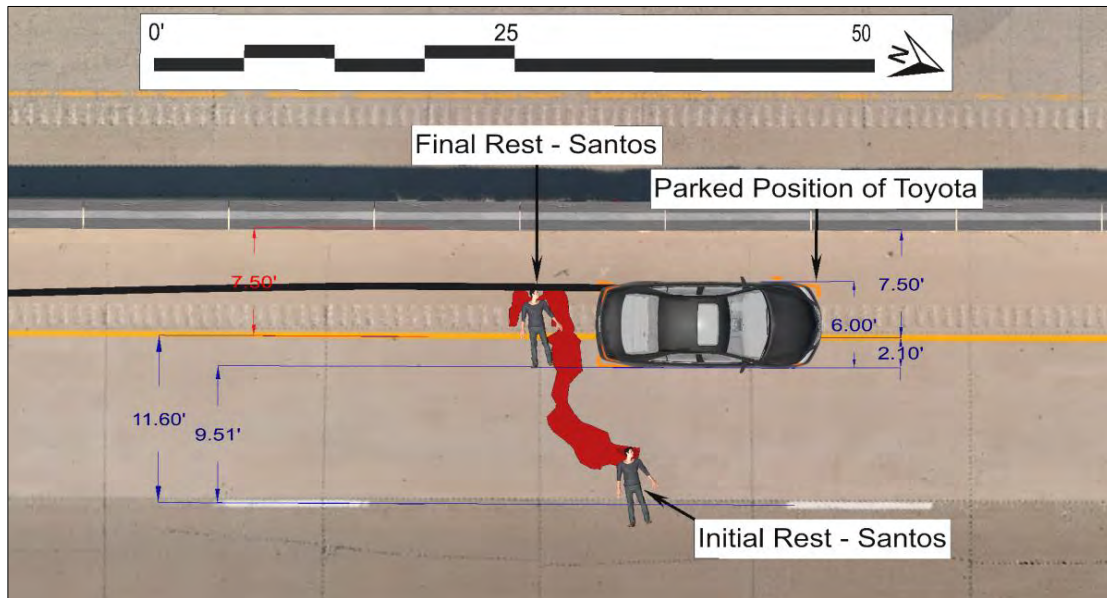


Figure 121: Approximate initial rest of Mr. Santos.



Figure 122: Impact model match.



Figure 123: Impact model match.



Figure 124: Impact model match.



Figure 125: Impact model match.



Figure 126: Impact model match.



Figure 127: Impact model match.



Figure 128: Impact model match.



Figure 129: Impact model match.



Figure 130: Impact model match.



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Figure 131: Impact model match.

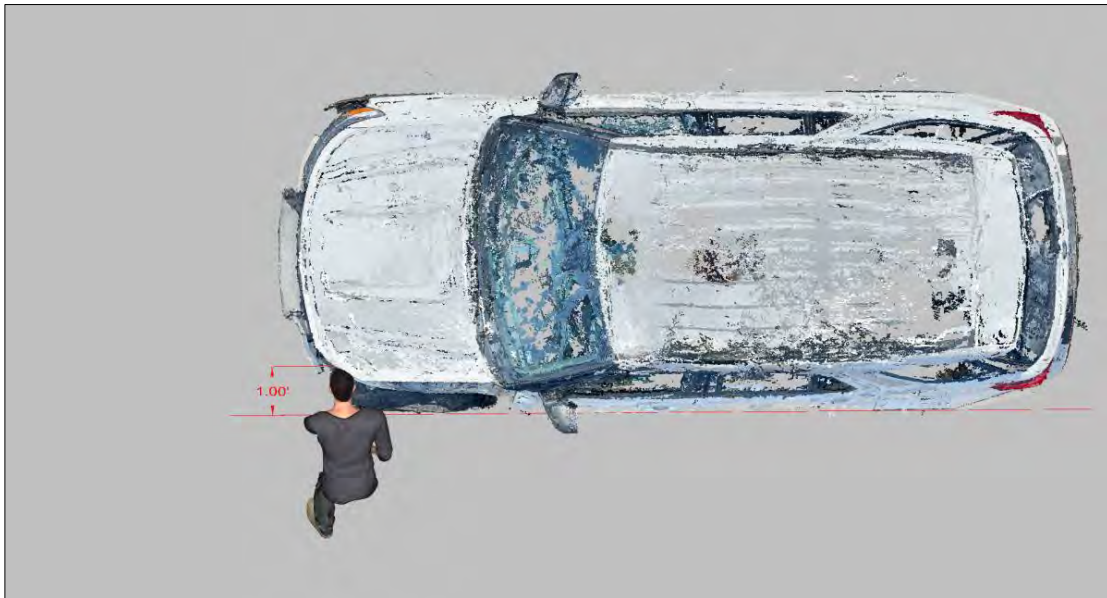


Figure 132: Impact model match.



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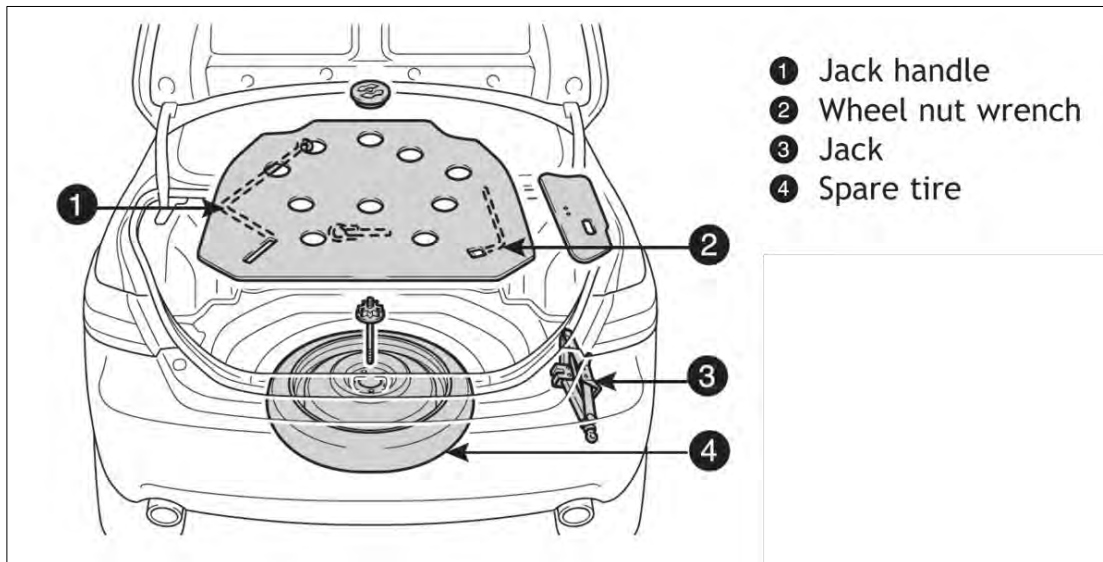


Figure 133: Toyota owner's manual instructions on replacing spare tire.

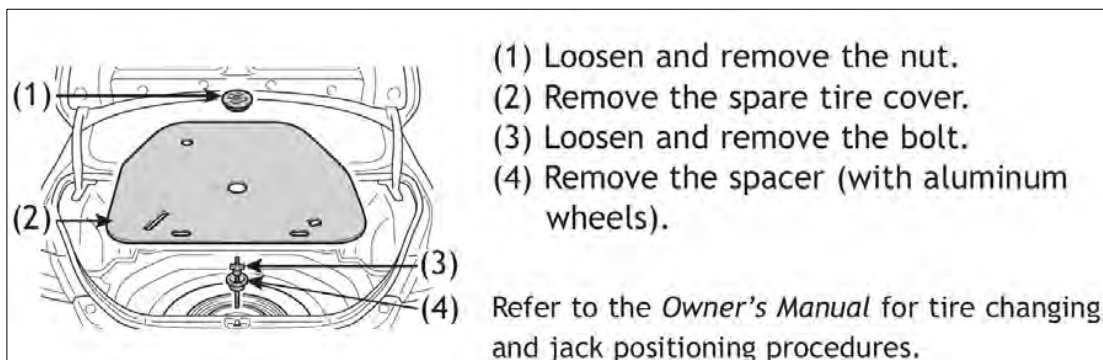


Figure 134: Toyota owner's manual instructions on replacing spare tire.



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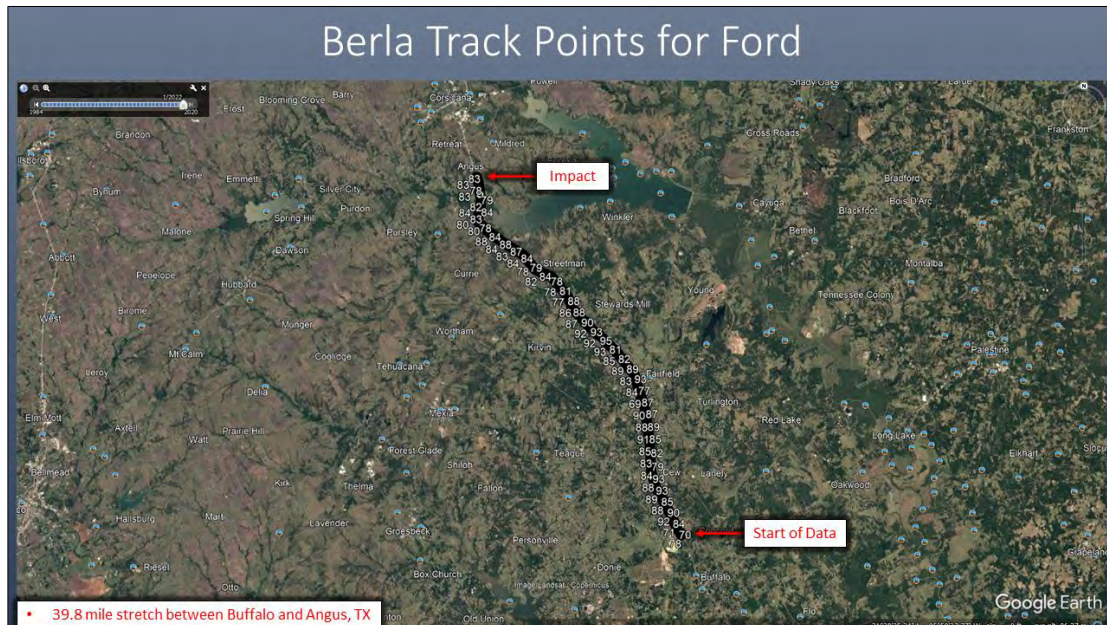


Figure 135: Berla track point data.



Figure 136: Berla track point data.

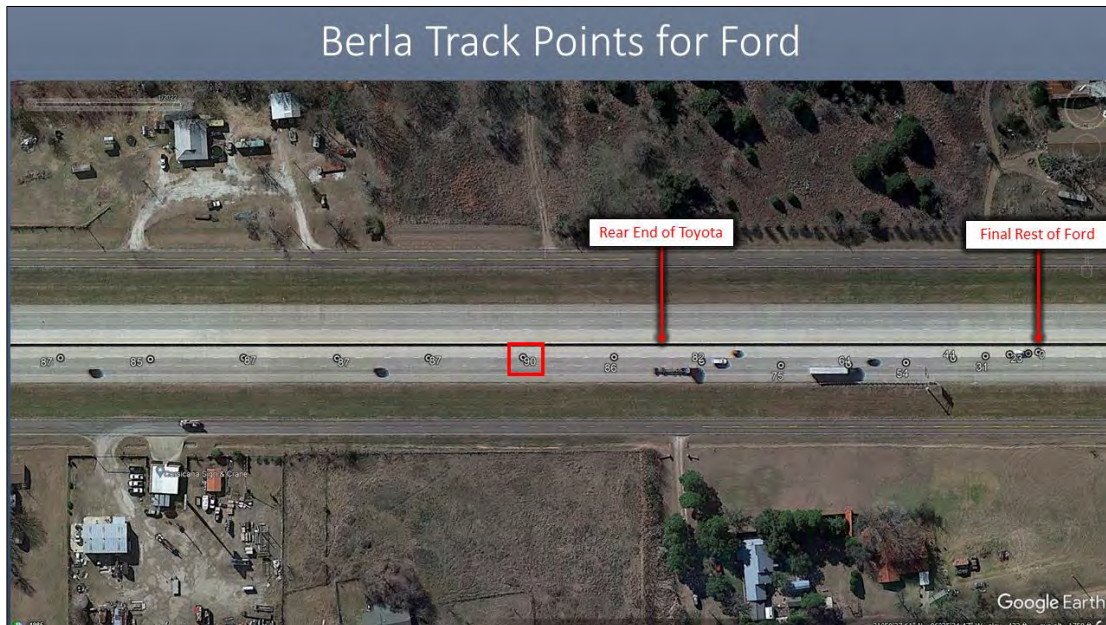


Figure 137: Berla track point data.

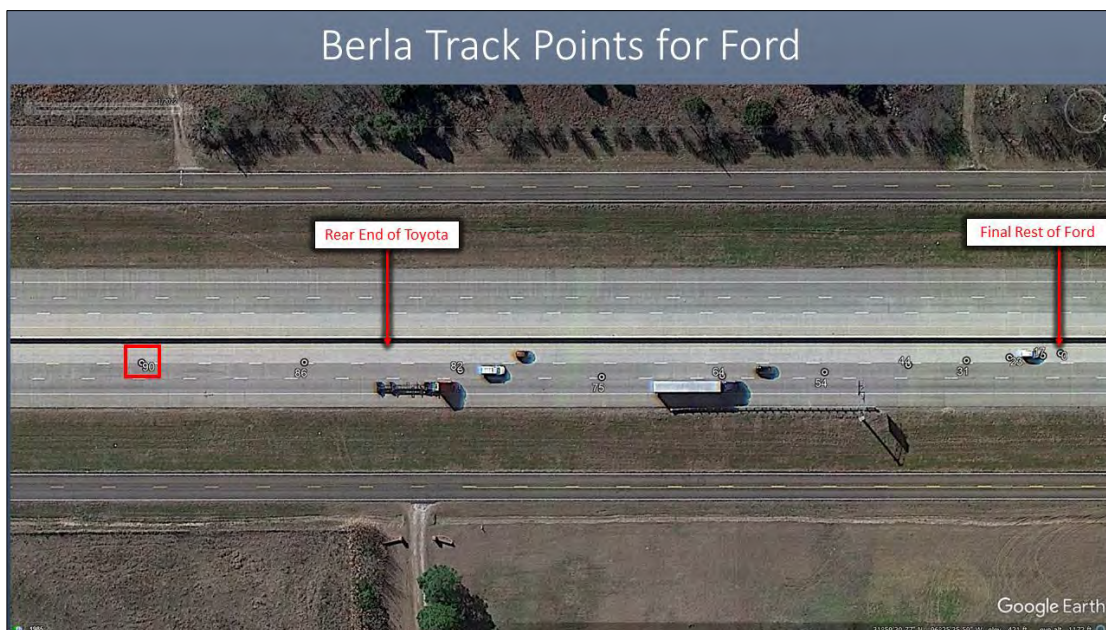


Figure 138: Berla track point data.



Nehemias Pivaral Santos v. Smith and Eastman
Focus Forensics File No. 36-13811
September 28th, 2023

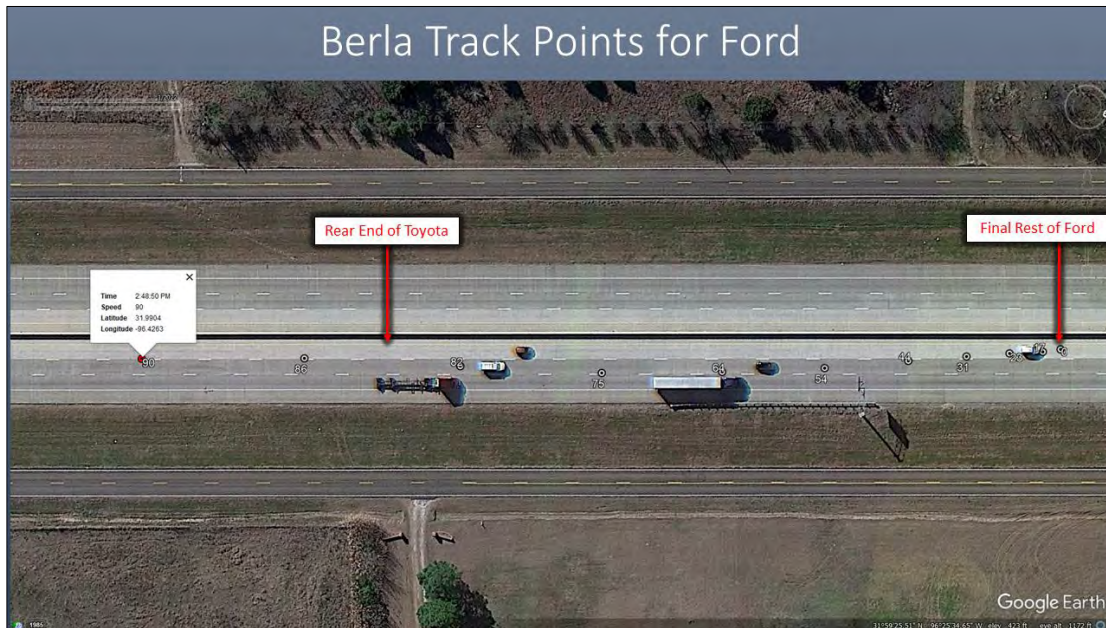


Figure 139: Berla track point data.

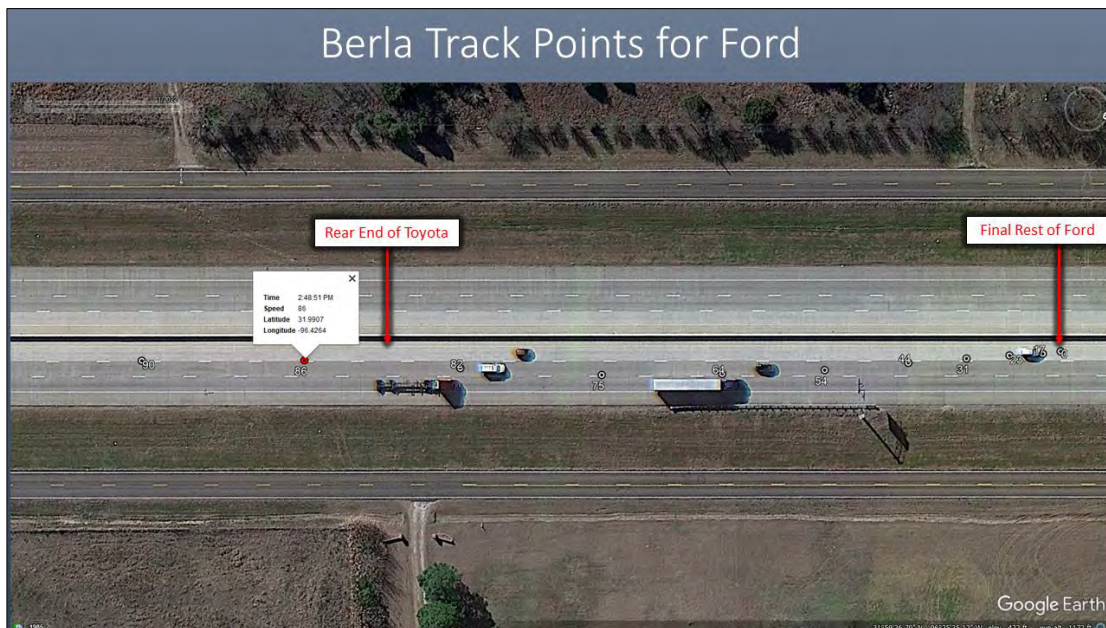


Figure 140: Time stamp just before collision.



Nehemias Pivaral Santos v. Smith and Eastman
Focus Forensics File No. 36-13811
September 28th, 2023

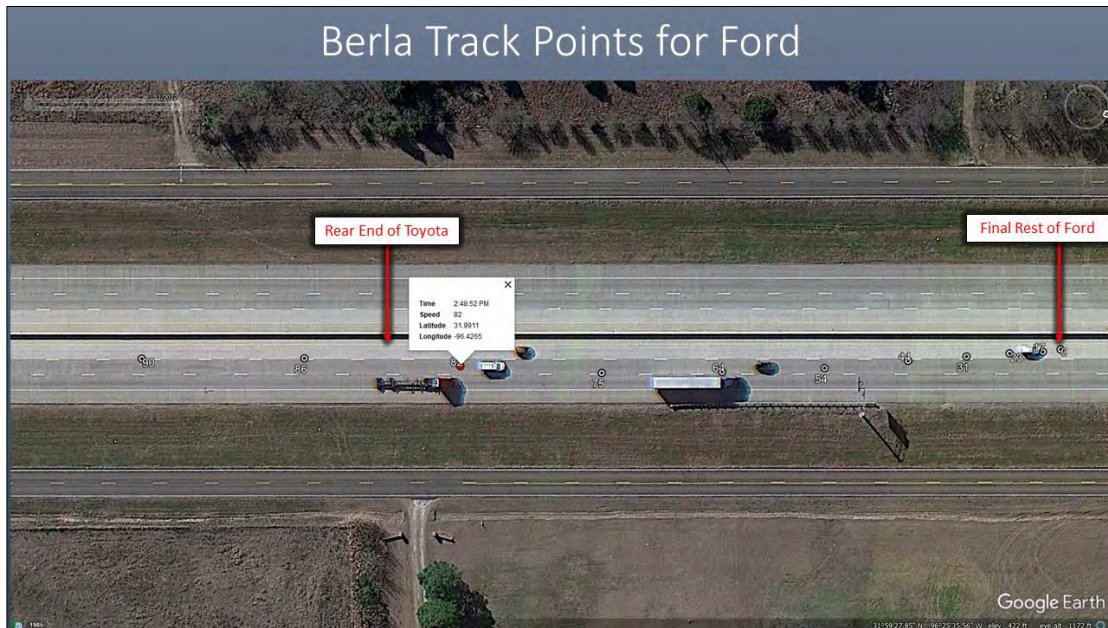


Figure 141: Time stamp just after collision.

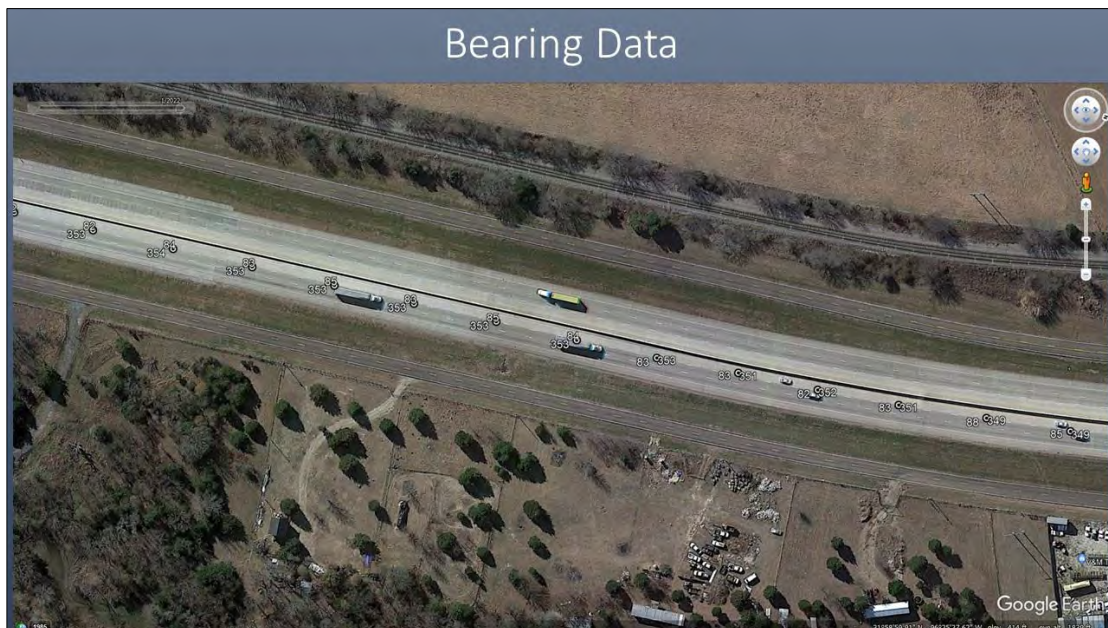


Figure 142: Ford bearing data in degrees CCW from due north.



Figure 143: Ford bearing data in degrees CCW from due north.



Figure 144: Ford bearing data in degrees CCW from due north.

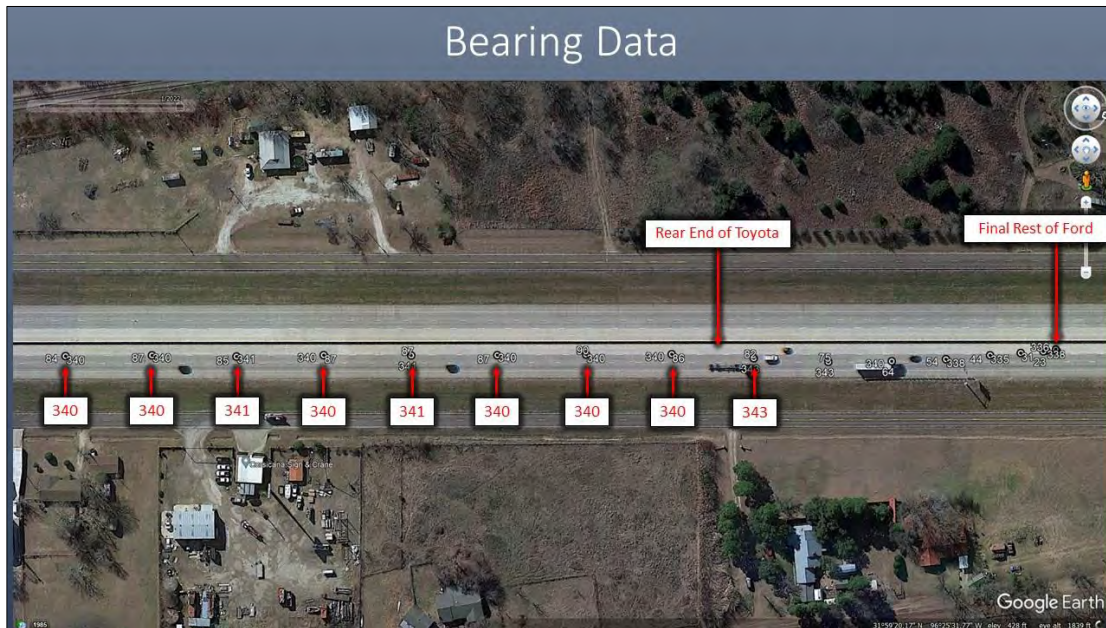


Figure 145: Ford bearing data in degrees CCW from due north.

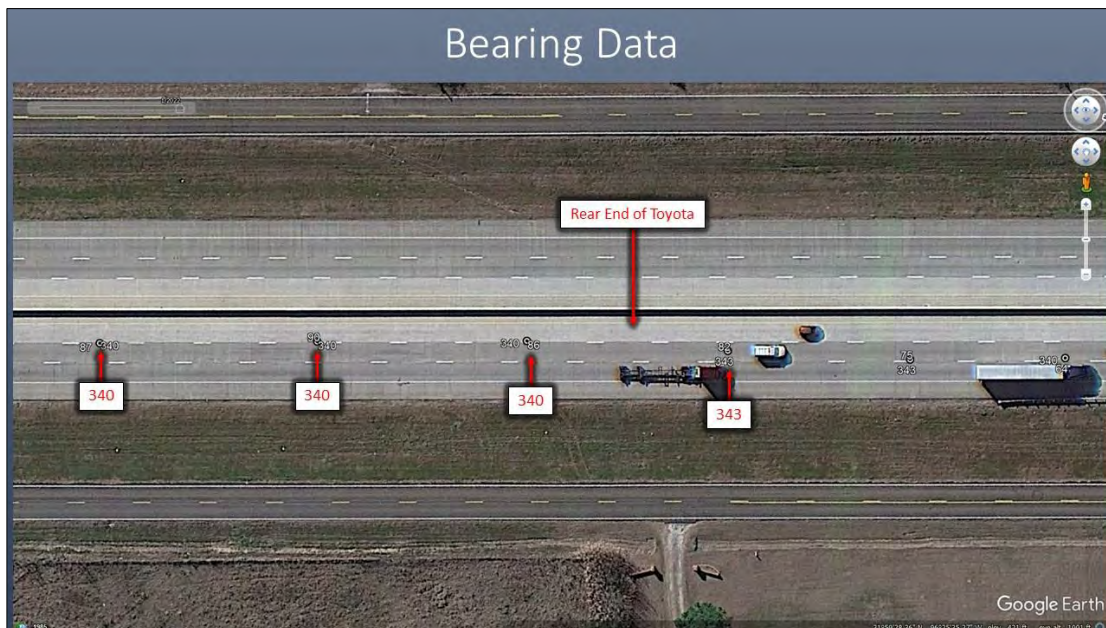


Figure 146: Ford bearing data in degrees CCW from due north.



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Nehemias Pivaral Santos v. Smith and Eastman
Focus Forensics File No. 36-13811
September 28th, 2023

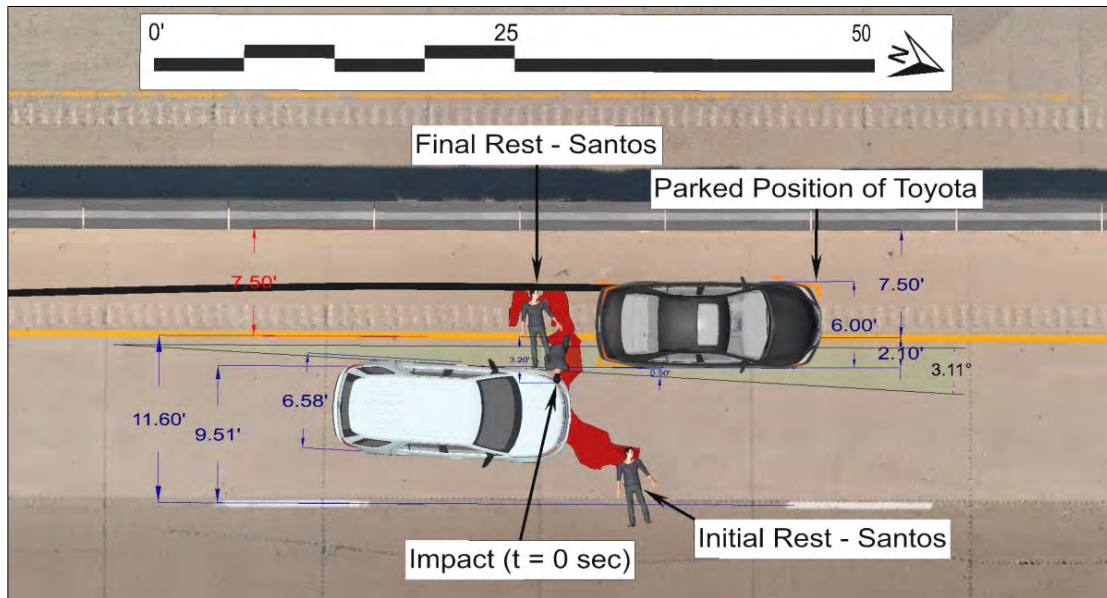


Figure 147: Plaintiff version.

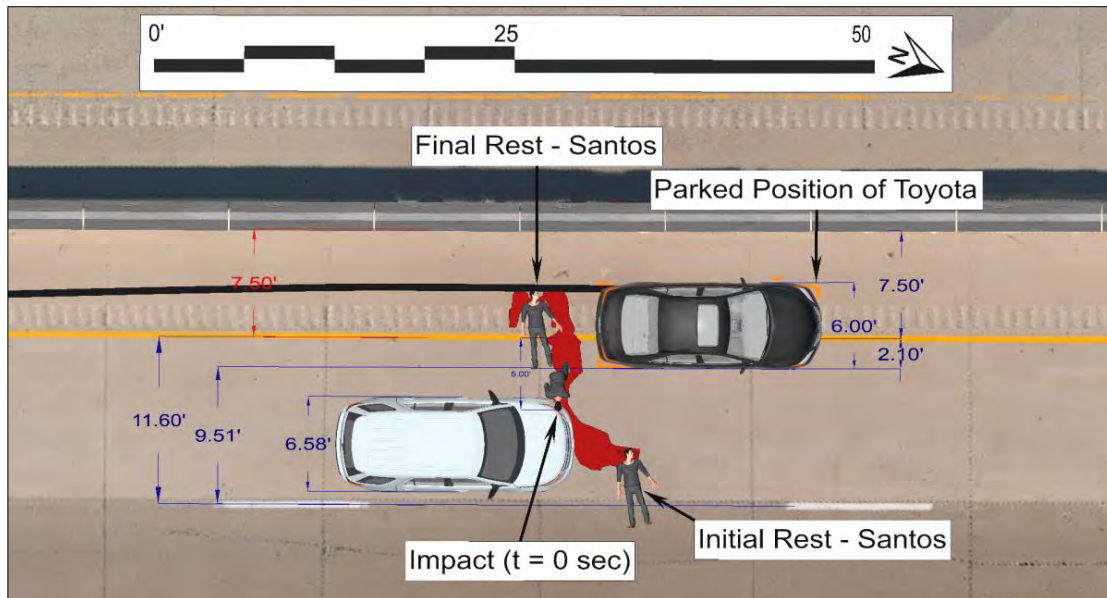


Figure 148: Defendant version.

EXHIBIT B

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TOMORROW'S TECHNOLOGY TODAY



1 IN THE UNITED STATES DISTRICT COURT FOR THE
2 NORTHERN DISTRICT OF TEXAS

3 Civil Action No. 3:22-CV-02714-K

4 ERICK RODERICO PIVARAL
5 GONZALEZ, Individually and as Special
6 Administrator of the Estate of
7 NEHEMIAS R. PIVARAL SANTOS,
8 DECEASED, ERICK SANTOS, and
9 EVELYN MORENO,

CONDENSED

Plaintiffs,

vs.

10 CAYLEE ERIN SMITH &
11 EASTMAN CHEMICAL COMPANY,

Defendants.

12 _____/

VOLUME I

15 DEPOSITION OF: PAUL J. MONTALBANO

16 DATE TAKEN: Tuesday, December 19, 2023

18 TIME: 10:12 a.m.

19 PLACE: Wingate by Wyndham
20 5750 Hazeltine National Drive
21 Orlando, Florida 32822

22 TAKEN BY: Plaintiffs

23 REPORTED BY: Jennifer Prohaska
24 Court Reporter and Notary Public
25

401 EAST JACKSON STREET,
SUITE 2370
TAMPA, FL 33602

315 EAST ROBINSON STREET,
SUITE 510
ORLANDO, FLORIDA 32801
CORPORATE

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ALSO APPEARING:

VANESSA McCORMICK, Videographer



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- - - - -
S T I P U L A T I O N S

It is hereby stipulated by and between counsel for
the respective parties that the reading and signing of
the deposition be reserved.



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P R O C E E D I N G S

* * * * *

THE VIDEOGRAPHER: On record. My name is Vanessa, and Jennifer is the court reporter. Today is the 19th day of December, 2023. The current time is 10:12 a.m. We are here to take the deposition of Paul J. Montalbano in the matter of Erick Roderico Pivaral Gonzalez, individually and as special administrator of the estate of Nehemias R. Piveral Santos, deceased, Erick Santos, and Evelyn Moreno versus Caylee Erin Smith and Eastman Chemical Company, pending in the District Court of the Northern District of Texas, Civil Action No. 3:22-CV-02714-K as in kilo.

Will Counsels please introduce themselves for the record, starting with the plaintiff's counsel.

MR. WHITE: This is Jacob White. I'm representing plaintiffs.

MR. DUBOFF: Gregory DuBoff representing Defendants Caylee Erin Smith and Eastman Chemical Company.

THE VIDEOGRAPHER: Thank you.

And for the deponent, can you please state your full name for the record?

THE WITNESS: Paul Joseph Montalbano.



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1 THE VIDEOGRAPHER: Thank you. And can you
2 please raise your right hand to be sworn in by the
3 court reporter?

4 THE REPORTER: Do you solemnly swear or
5 affirm that the testimony you shall give will be
6 the truth, the whole truth, and nothing but the
7 truth?

8 THE WITNESS: I do.

9 PAUL J. MONTALBANO,
10 having first been duly sworn, testified as follows:

11 DIRECT EXAMINATION

12 BY MR. WHITE:

13 Q. All right. We will begin. Will you state
14 your full name for the record?

15 A. Paul Joseph Montalbano.

16 Q. Okay. Where are you employed?

17 A. Focus Forensics.

18 (Exhibits 1, 2, and 3 were marked for
19 identification.)

20 MR. WHITE: And just for the record, we've
21 already premarked them, the report as Exhibit 1,
22 his CV as Exhibit 2, and --

23 MR. DUBOFF: Right.

24 MR. WHITE: -- his case list as Exhibit 3.
25 We try and do this paper-light, you know. His



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1 report already has most of the photos in it.

2 MR. DUBOFF: Sure.

3 BY MR. WHITE:

4 Q. Okay. When were you engaged by Defense
5 Counsel in this matter? And would you identify for the
6 record when you look at your laptop? If you have to
7 consult a document to answer a question, it's fine if you
8 do; just tell us what you consulted to answer a question.

9 A. Sure. So I'm looking at our retention
10 agreement, which is dated April 26, 2023. So on or about
11 that date is when we were retained.

12 Q. So just to make sure I got that: April 6th,
13 2023, on or about?

14 A. April 26th.

15 Q. 26th. Okay.

16 So I take it you've been deposed before,
17 right?

18 A. Yes, sir.

19 Q. So you know the general ground rules. Oral
20 answers, no uh-huhs or -- head shaking is fine, but
21 accompany it with an oral answer.

22 So I'll skip sort of my general litany of
23 rules, except for, can we agree that if I ask a question
24 and you answer it, that that means that you understood my
25 question?



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App. 000101

1 A. Yes, sir.

2 Q. And if you don't understand one of my
3 questions, just stop me and say, "Hey, man, I didn't
4 understand that question. Try again."

5 A. Sounds good.

6 Q. Okay, perfect.

7 So this is also just for the record: You
8 received a subpoena for this deposition, correct?

9 A. Yes, sir.

10 Q. And that subpoena asked you to produce
11 certain documents, right?

12 A. Yes.

13 Q. And you have, before we went on the record,
14 you've given me a USB drive with your entire file?

15 A. Yes.

16 Q. And you believe that that is responsive
17 entirely to the document request that I sent you?

18 A. Yes. That is my entire file front to back.

19 Q. Okay, perfect, perfect.

20 And it includes a transcript either of your
21 deposition and your trial testimony, or one or the other
22 from the estate of Sari Marcus, correct?

23 A. Yes. It includes my deposition transcript.
24 I was never provided my trial transcript, so I don't have
25 that in my possession.



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App. 000102

1 Q. Very good, very good.

2 MR. DUBOFF: And, Jake, if I could, so in
3 talking with Paul, I think one interpretation of
4 your subpoena would have required him to produce
5 communications with Counsel.

6 MR. WHITE: Obviously, right.

7 MR. DUBOFF: Yeah, and so -- but I know -- I
8 don't think there was anything, but my instructions
9 are Paul to produce any communications to the
10 extent they were relevant to any of his opinions in
11 this case.

12 MR. WHITE: Right, right. And that's -- I
13 think we agree there are certain communications
14 with Counsel that are relevant. Some are --

15 MR. DUBOFF: Yes.

16 MR. WHITE: -- semi-privileged, and I take it
17 your instruction was, "Provide the ones that are
18 relevant and unprivileged"?

19 MR. DUBOFF: Correct.

20 MR. WHITE: Okay. Got it, got it. All
21 right.

22 BY MR. WHITE:

23 Q. So let's take a look at your CV here for a
24 second. Can you tell us what degrees you hold and from
25 what institutions?



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App. 000103

1 A. I hold a bachelor of science in mechanical
2 engineering and a master of science in mechanical
3 engineering from the University of South Florida.

4 Q. Okay. And when did you receive those
5 degrees?

6 A. It was received simultaneously in 2013. I
7 attended what they called an accelerated master's program
8 where you could skip the bachelor's graduation and
9 receive both degrees at the same time.

10 Q. So was that a four-year program, or was it,
11 like, a combined six-year program?

12 A. A five-year program.

13 Q. Five-year program. Okay.

14 And can you tell us in general what you
15 studied to receive that degree -- those degrees?

16 A. So my discipline was mechanical engineering.
17 My specialties within mechanical engineering during my
18 graduate research and graduate coursework were kinetics,
19 kinematics, dynamics, and physics, which are all
20 disciplines and studies of the motion of objects, how
21 objects behave during impacts, predicting motion of
22 objects based on impacts. Anything with movement,
23 basically, was what I specialized in in my graduate
24 studies.

25 Q. Okay. And do people get that degree, the



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App. 000104

1 degree that you received and the training you received
2 for your master's, in order to become accident
3 reconstructionists? Or are there other professions that
4 people get that training for?

5 A. Accident reconstruction has a broad range of
6 foundational education. The core foundation is
7 mathematics and physics, so anything that really provides
8 you a great foundation of mathematics and physics is
9 typically sufficient to go into the field of accident
10 reconstruction analysis.

11 Since graduating with my graduate degree in
12 2013, I have taken 45 courses directly in the field of
13 accident reconstruction and human factors, which directly
14 applies the engineering principles and foundations from
15 my college degrees directly to the field of accident
16 reconstruction and human factors analysis.

17 Q. So have you referred to yourself before as a
18 forensic engineer?

19 A. We have many titles: consultant, forensic
20 engineer. I still am a mechanical engineer by trade.
21 Forensic just means that I'm reverse engineering
22 something that happened in the past.

23 Q. Okay. Is any one of those titles more
24 accurate than another -- accident reconstructionist,
25 mechanical engineer, forensic engineer -- as applied to



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App. 000105

1 yourself?

2 A. I have no preference of which title I am. It
3 all applies engineering principles to something that's
4 happened in the past. We are reverse engineering
5 something using math and science.

6 Q. Okay.

7 A. So all of those titles, I think, categorize
8 that sufficiently.

9 Q. And I've seen -- and tell me -- this is sort
10 of a mouthful. Have you ever called yourself an accident
11 reconstruction forensic engineer?

12 A. I think so, yeah. Maybe not together, but
13 yeah, accident reconstructionist --

14 Q. Okay.

15 A. -- human factors analyst, expert, a lot of
16 different titles.

17 Q. So what -- and tell me if this question is
18 based on a faulty premise. What are the three tiers of
19 accident reconstruction?

20 A. What I think you're referring to is the HVE,
21 is what we categorize it in an acronym. It's the human
22 aspect, the vehicular aspect, and the environmental
23 aspect. Those are kind of the three tiers that we
24 analyze independently in an accident reconstruction
25 analysis. You obviously have the vehicle, which is what



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App. 000106

1 is engaging in the physics; you have the human component,
2 which is applying the input to that vehicle; and then the
3 environment, which affects how those objects behave
4 during and after collisions.

5 Q. Okay. So -- and I think you've already
6 summarized those for me. Do you look at both -- all
7 three -- H, V, and E -- when creating an accident
8 reconstruction report?

9 A. Typically, yes. It depends on the amount of
10 available evidence. Sometimes I am able to provide more
11 information on some cases versus other cases. It just
12 depends on the available evidence that I have to me.

13 Q. So of the -- and I may be butchering the
14 acronym -- of the HVE boxes, you don't look at each one
15 of those boxes necessarily; just depends on what evidence
16 you get in a given case?

17 A. I don't know if I would say that I really
18 delineate the boxes versus just encompass them as a whole
19 in my analysis.

20 Q. Okay, okay. So when did you receive your PE
21 license?

22 A. 2016, I believe, the end of 2016.

23 Q. And which states do you have PE licenses in?

24 A. Florida, Georgia, Mississippi, and Alabama.

25 Q. Is the process for getting a PE license in



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App. 000107

1 each one of those states the same?

2 A. Yes. It's simply paying the state the fees
3 for reciprocity.

4 Q. So how many times did you have to take the PE
5 test?

6 A. Just once.

7 Q. Can you describe the PE test?

8 A. The PE test is an eight-hour examination that
9 fully encompasses all of the disciplines of the
10 particular category that you choose to take. In my case,
11 I chose mechanical systems, which includes, obviously,
12 the physics that I use in accident reconstruction
13 analysis, but it also includes heat transfer, HVAC, other
14 various components of mechanical engineering. So it's a
15 very broad encompassing test, but it just generally
16 proves competency in the field of engineering.

17 Q. So do you -- well, can you describe your
18 education involving fluid dynamics?

19 A. Fluid dynamics was a pretty extensive part of
20 my coursework. I don't have any graduate experience in
21 fluid dynamics. It is similar to aerodynamics, which
22 could arguably be a part of accident reconstruction
23 analysis. So in part, it does rely on the same generic
24 physics principles, forces and motion, because you are
25 talking about aerodynamic or fluid dynamic drag forces,



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App. 000108

1 things like that. So the principles are all the same
2 foundational principles; they're just applying it to a
3 very specific aspect.

4 Q. Okay. And I mean, fluid dynamics can get
5 pretty complex in the details of it, right? I mean,
6 it's -- I know you said you've got coursework on it.
7 Would you describe yourself as an expert in fluid
8 dynamics?

9 A. Well, specifically how we think of it in
10 layman's terms, fluid dynamics is anything in the water.
11 Technically, I don't have specialized expertise analyzing
12 submarines or boats, things like that. But again, the
13 foundational principles of fluid dynamics is just the
14 same core principles of physics and engineering.

15 Q. And I'm not trying to trick you. I take it
16 you didn't rely on fluid dynamics when generating your
17 conclusions in this report, did you?

18 A. Not in the way I think you're referring to
19 it. Now, certainly, there are trajectories of things
20 like fluids in an accident that I have considered. But
21 what I think you're referring to is more mechanical
22 design of systems that operate in water. No.

23 Q. Well, what I'm trying to get at is, did you
24 rely on fluid dynamics when -- to the extent you did
25 this -- when you calculated how, like, say, blood or bone



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App. 000109

1 or brain matter was thrown? Did you do anything like
2 that?

3 A. Not in regards to what I would say is fluid
4 dynamics versus physics: trajectories, impacts, speeds,
5 times, distances, angles, vectors.

6 Q. Okay, okay. Do you think that you need a
7 background in physics in order to reach the conclusions
8 that you drew in your report regarding, say, the fluids
9 that were thrown, or the way Mr. Santos's body was thrown
10 around?

11 MR. DUBOFF: Object -- object as ambiguous.

12 A. I don't think so. I've seen many
13 reconstruction experts have backgrounds in civil
14 engineering that are able to generally understand the
15 concepts of physics. It's a basic principle,
16 mathematical principle, that any mathematical discipline
17 encompasses.

18 Q. So I take it -- and correct me if I'm wrong.
19 Do you think that you need a background in mathematics in
20 order to be an accident reconstructionist?

21 A. No. There are a lot of law enforcement that
22 do not have any educational background that are able to
23 perform accident reconstruction analyses based on direct
24 education with regards to accident reconstruction.

25 Q. Okay. Can you describe your education



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App. 000110

1 involving material sciences?

2 A. Same answer as fluid dynamics. I took
3 extensive courses in material sciences in regards to,
4 really, the macro level of the material components. So
5 material science is very broad; I'm talking down to the
6 finite material element components versus simple
7 structural force calculations.

8 So you could certainly be a metallurgist that
9 analyzes more on a chemical scale the structure of
10 material; or on a more physics standpoint, the failure
11 points of materials based on the force applications, the
12 deformation of those materials based on force
13 applications. So again, that question kind of can take
14 you many different ways; just depends on which way you're
15 actually asking.

16 Q. Well, I guess, do you consider yourself an
17 expert in any of those types of material sciences?

18 A. Well, you certainly need to know material
19 properties when you are doing any force equations applied
20 to an object. So in a sense, yes, of course. Any
21 engineering discipline relies on material properties.

22 Q. Okay. And did you do any calculations like
23 that to generate your report in this case?

24 A. In this particular one, I don't believe the
25 material characteristics came into any of the equations.



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App. 000111

1 Typically, you'll find that in a crash analysis, is what
2 we like to call it, when we factor in the force of an
3 impact based on how much damage we see to a vehicle.
4 Those types of methodologies don't necessarily apply to
5 pedestrian impacts.

6 So in this particular case, I don't believe
7 there were really any specific material engineering
8 principles involved other than observations of how the
9 damage transpired in doing a damage match, which is a
10 foundational principle of accident reconstruction.

11 Q. Okay. So can you tell us -- for those of us
12 that aren't engineers -- what the study of kinetics is?

13 A. Kinetics is the study of the motion of
14 objects, how objects behave in the environment, speeds,
15 times, distances, things like that.

16 Q. So again, for the nonengineers amongst us, I
17 take it if I showed you how a billiard ball hit one other
18 billiard ball, the study of kinetics would tell you how
19 the billiard balls are going to move after impact?

20 A. Did you say "kinetics" or "kinematics"?

21 Q. I said "kinetics."

22 A. Okay. So I'm sorry. Kinetics is -- you're
23 right: billiard balls is a great example of kinetics.

24 Q. Okay.

25 A. Kinematics is more of the motion of objects.



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App. 000112

1 Kinetics analyzes the impacts.

2 Q. So -- so can you repeat that answer? I'm
3 sorry. Let's go off the record.

4 THE VIDEOGRAPHER: The time is 10:28 a.m.,
5 and we're off record.

6 (Break was taken from 10:28 p.m. to
7 10:28 a.m.)

8 THE VIDEOGRAPHER: The time is 10:28 a.m.,
9 and we are on record.

10 BY MR. WHITE:

11 Q. Okay. So sorry, we had a brief interruption.
12 Let's -- can you describe the difference between kinetics
13 and kinematics?

14 A. In the most simple terms, kinetics is the
15 study of impacts. Kinematics is the study of the motion
16 of objects in time and space.

17 Q. Okay. So just let's go back to my billiard
18 ball analogy. Kinetics is the study of how, when two
19 billiard balls hit each other, what happens, right?

20 A. Yes.

21 Q. And kinematics is the study of, as a billiard
22 ball rolls, I guess, how it's rolling or, like, what you
23 can expect it to do?

24 A. Well said.

25 Q. Okay. All right. Just I don't know, right?



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App. 000113

1 I just want to make sure.

2 So can you describe your education on
3 kinetics and kinematics?

4 A. My education starts in my bachelor's degree.
5 Kinematics and kinetics is a core principle of mechanical
6 engineering. So there were courses titled kinetics;
7 there were courses titled kinematics; there were courses
8 titled dynamics, which is the combination of kinetics and
9 kinematics. So those were very large foundational
10 principles learned early on in almost any engineering
11 degree.

12 In addition to that, my graduate research
13 involved the exclusive study of the motion of objects and
14 forces in my graduate research.

15 Q. Okay. And just to bring it into this case,
16 have you studied, trained, or had work experience in the
17 kinetics/kinematics of pedestrian interactions with motor
18 vehicles?

19 A. In my professional experience, yes.
20 Throughout my 45 courses taken directly in the field of
21 accident reconstruction, pedestrian impacts are a large
22 portion of what we analyze; so therefore, it's a large
23 portion of the curriculum in any accident reconstruction
24 course. And the foundational principles are kinetics and
25 kinematics, but then they are applied directly to



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1 pedestrian impacts with vehicles and also comparing that
2 or using empirical test data.

3 Q. Okay. So can you describe -- so your
4 postcollege and grad school experience with kinematics
5 and kinetics as applied to pedestrian impacts?

6 A. Really, any pedestrian is going to rely on
7 those foundational principles. Whether you know you're
8 relying on it or not when you use the equations, you are.
9 So the accident reconstruction curriculum gives you these
10 equations established from empirical test data and
11 studies that help us predict pedestrian movement based on
12 various forms of impact configurations. And again, it's
13 just going back to the foundational engineering
14 principles of kinetics and kinematics, whether you know
15 it or not.

16 Q. So what are those equations that you're
17 referring to?

18 THE VIDEOGRAPHER: Can you move your mic a
19 little bit? It's rubbing your tie. Pardon me.

20 Thank you. Sorry.

21 BY MR. WHITE:

22 Q. Let me see -- let me see if I can remember my
23 last question.

24 A. I think you said, What are those equations?

25 Q. What are those equations? Yes, thank you.



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1 A. Typically, the most-used pedestrian impact
2 equations are predicting vehicle speed based upon
3 pedestrian throw. There are various types of equations
4 used based on the type of impact configuration, whether
5 it is a full-frontal impact, whether it is a low-fronted
6 vehicle versus a high-fronted vehicle, whether it's a
7 corner clip, or what we call a fender-vault-type
8 orientation. There are various empirical equations that
9 we can use based on the throw distance of a pedestrian to
10 predict the speed of the vehicle.

11 Q. Now, did you have to do any of the
12 calculations in this case?

13 A. Not in this case. The pedestrian actually
14 subsequently collided with the parked Toyota and then
15 back into the subject Ford, so pedestrian throw distance
16 wasn't a variable available to us in this analysis.

17 Q. And you didn't need it, right, because we had
18 electronic data on Caylee Smith's speed, right?

19 A. That is true.

20 Q. Okay. So when did you start working
21 professionally as an accident reconstructionist?

22 A. January 2nd, 2013.

23 Q. Okay. And how many accident reconstruction
24 reports have you generated since then?

25 A. Reports or analyses? I don't generate

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1 reports for every case.

2 Q. Okay. Well, first, tell us the difference
3 between a report versus an analysis.

4 A. So typically in Florida, we actually rarely
5 physically write reports. Our analysis is typically
6 communicated through a deposition or a trial. So I know
7 it may be different in other states, so I just want to
8 delineate when you ask the question with reports.

9 To give you a full comprehensive answer, I
10 have performed thousands of accident reconstruction human
11 factors analyses. Certainly, a fraction of those make it
12 to a deposition or a trial where I'm communicating on
13 record. But almost all of them result in at least
14 communicating my findings to retaining counsel that hired
15 me. All of them involve actually performing an
16 engineering analysis based on the evidence collected.

17 Q. So -- but you don't always -- strike that.

18 How many reports have you generated like the
19 reports in this case, if you know?

20 A. I don't have that teed up. Certainly,
21 federal cases require reports, so there's been a handful
22 of those that I've written. Sometimes clients want a
23 report to put my findings on paper. I don't have an
24 exact answer for you.

25 Q. Okay. All right. That's fine.



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1 What -- roughly, what percentage of -- and
2 we'll -- when I say "reports" or "analyses," let's just
3 say let's take the whole universe of both here. So what
4 percentage of the analyses and reports that you've
5 written have been for defense versus plaintiff, if you
6 know?

7 A. We don't track that other than on my
8 testimony history list, which the last I counted was a
9 good 50-50 split on my actual testimony. My estimation
10 based on just overall being retained to perform an
11 analysis is also a good 50-50 split between plaintiff and
12 defense.

13 Q. And of the reports and analyses that you
14 generated, any idea, roughly, what percentage of it
15 involved pedestrian interaction with a motor vehicle?

16 A. That's a good question. I would say, could
17 be up to 10 percent. There are various types of
18 vehicular accidents we involve -- that we are involved
19 in: commercial vehicle collisions, passenger vehicle
20 collisions, pedestrian collisions, daytime, nighttime;
21 there's so many different variables to every case. I
22 would say a large portion of that would be pedestrian.

23 Q. Okay. Any of the reports or analyses that
24 you're thinking of involving motor vehicles going over 80
25 miles an hour interacting with a pedestrian?

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1 A. I can think of one off the top of my head,
2 but I don't have the others teed up. But that's
3 certainly happened.

4 Q. Okay. Well, the one that you're thinking of,
5 can you tell us what you recall about that case?

6 A. It was a Mustang traveling, I think, almost
7 100 miles per hour when it struck a pedestrian crossing
8 the road.

9 Q. Okay. Do you remember what your conclusions
10 were in that case?

11 A. I have no idea. That was many years ago.

12 Q. Do you recall if you were retained on behalf
13 of the pedestrian or the Mustang driver?

14 A. I couldn't even tell you that.

15 Q. Okay. So you don't remember anything else
16 other than it was a Mustang going about 100 and a
17 pedestrian?

18 A. That's all I can remember on that one. I'm
19 just trying to think of high-speed pedestrian collisions.
20 Certainly, I know there's others of the thousands I've
21 analyzed generally in cases. But I just can't think of
22 all of them. There's so many.

23 Q. Okay, okay. Has your expert testimony ever
24 been limited by a court, that you're aware of?

25 A. No, it has not.



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1 Q. Okay. So no Daubert rulings or anything like
2 that?

3 A. No. Certainly, there's been attempts or
4 motions attempted to be filed, but none have made it
5 through --

6 Q. Okay.

7 A. -- even to be processed by a judge.

8 Q. How many times have you testified at trial,
9 if you remember?

10 A. I want to say somewhere in the teens, maybe
11 15 to 20.

12 Q. Okay. Over, I guess, the last ten years?

13 A. Yes.

14 Q. Okay. Mostly in Florida, or all over the
15 country?

16 A. Mostly in Florida. I have testified
17 throughout the country, but most of it is Florida.

18 Q. Okay. So do you recall the case of the
19 Estate of Sari Lynn Marcus versus -- there's some
20 entities, but it's basically FedEx.

21 A. Vaguely, yes. I didn't spend any time
22 reviewing that transcript you requested, but I vaguely
23 remember the case.

24 Q. So -- and tell me if what I'm about to
25 describe is inaccurate to your recollection, okay?



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1 A. Sure.

2 Q. That was a case where there was a FedEx truck
3 stopped on a two-lane residential road, and somebody
4 passed the FedEx behind it, basically, trying to go
5 around the FedEx truck. Does that sound right?

6 A. Yes.

7 Q. And then there was someone coming in oncoming
8 traffic, or -- excuse me. I guess there was somebody
9 coming in the other lane, basically, going to pass the
10 FedEx truck, right?

11 A. Yes, in the opposite direction.

12 Q. In the opposite direction, thank you.

13 And that person lost control of their
14 vehicle, striking some sort of utility pole, and they
15 died, right?

16 A. Correct.

17 Q. Okay. So do you remember what your
18 conclusions were about that case?

19 A. I had many conclusions; I don't know if I can
20 summarize them in one sentence. But I do recall there
21 being speed involved with that vehicle; I recall there
22 being wet roadways; I recall there being an
23 overcorrection of her vehicle, and that's all I can
24 really recall.

25 Q. So was -- do you recall doing a calculation,



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1 calculating that the driver that died was actually
2 traveling 70 miles an hour on a residential road?

3 A. That sounds about right.

4 Q. Okay. And do you recall that the speed limit
5 was about 45 miles per hour?

6 A. I don't have an independent recollection of
7 that, but I'll take your word for it.

8 Q. Okay. So do you do what is called an
9 avoidance opinion, I guess? Like, you basically provide
10 analysis about what would have avoided an accident,
11 right?

12 A. Depending on the facts of the case, yes.
13 Sometimes I will analyze -- let me back up. I will
14 independently change certain variables like speed to see
15 how that would affect the outcome of the case.

16 Q. So do you remember opining that Ms. Marcus,
17 the one that died, if she'd been traveling the speed
18 limit, she could have reduced her speed when she saw the
19 other vehicle get into her lane of traffic?

20 A. I do believe there was an opinion about that,
21 whether she would have been able to stop before the pole
22 impact, or maybe even be able to stop entirely before
23 crossing the FedEx truck's path, I vaguely recall.

24 Q. Okay. So just to break that down, do you
25 remember doing an analysis of whether or not, if the



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1 driver that died had been going the speed limit, she
2 would have been able to react in time to avoid losing
3 control of the vehicle?

4 A. Well, I'll dissect that a little bit. It's
5 not necessarily whether she would be able to react in
6 time, but how much distance and time would she have had
7 available to her to come to a complete stop.

8 Q. Okay, okay. So do you remember that your
9 testimony there was that she had -- well, strike that.

10 Do you recall how far away Ms. Marcus, the
11 one that died, was when she saw the SUV move into her
12 path in that case?

13 A. I don't.

14 Q. Does it sound right if I tell you you
15 testified that it was 309 feet?

16 A. I'll take your word for it.

17 Q. Okay. Do you agree that your testimony in
18 that case was that 309 feet was sufficient to spot and
19 avoid a hazard?

20 A. I vaguely recall that. However, that was an
21 imminent identifiable hazard. So every hazard is
22 different and needs to be analyzed differently in each
23 particular case. And I would not compare apples to
24 apples to the visual presentation of the hazard in that
25 case to the visual presentation of the hazard in this



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1 case.

2 Q. It was raining in that case, wasn't it?

3 A. It was.

4 Q. Okay. And that was a two-lane residential
5 road?

6 A. Yes.

7 Q. Okay. So in that case, Ms. Marcus's speed
8 was an important factor, right?

9 A. I wouldn't classify it as important or not.
10 It was a factor.

11 Q. But it was -- you did testify that if her
12 speed had been at the speed limit, that she would have
13 had time to brake to avoid the hazard?

14 A. Yes.

15 Q. Okay. And that, according to your
16 calculation, she would have had 309 feet in order to
17 conduct that braking?

18 A. I don't know if it was to simply conduct the
19 braking, or if that included perception response time and
20 distance. I don't know the answer to that. But
21 generally, that is what we try to look at is the
22 available distance based on when the known visual hazard
23 presented itself and analyze the time and distance based
24 on that known.

25 Q. Okay. So you did calculate there how long it



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1 would have taken -- strike that.

2 You did calculate in that case the distance
3 required for the driver that died to come to a complete
4 stop if they applied their brakes, right?

5 A. Yes, in response to the known imminent
6 hazard.

7 Q. Okay. So what is that analysis called? Is
8 that a braking analysis? I mean, that's just my little
9 phrase for it.

10 A. You can call it a braking analysis, an
11 avoidance analysis.

12 Q. Okay. Did you conduct a braking analysis in
13 this case?

14 A. No, because I didn't have enough knowns. We
15 don't know exactly when the imminent hazard presented
16 itself, so I have nothing to base my analysis off of. In
17 that case, the Marx case you're referring to, we had the
18 hazard on video; we knew exactly when it presented itself
19 and within the reconstruction timeline. So of course, if
20 I have a known, I can reverse engineer from that known.
21 When I don't have that known of when a hazard presents
22 itself, I can't base my analysis off of anything.

23 Q. So when you say the hazard presenting itself
24 in this case, are you talking about the -- Caylee seeing
25 the Toyota or Caylee seeing Nehemias?



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1 A. So there was actually two separate hazards
2 that were presented to Caylee in this case. The first
3 was the presence of the Toyota partially on the shoulder,
4 partially in the travel lane. She responded to that by
5 shifting over into her travel lane. We classify that as
6 something called a potential hazard.

7 It's not something that requires an emergency
8 response, but does likely require some form of a
9 response, maybe a correction of speed or a lateral
10 position, and that's what she said she did. She adjusted
11 her lateral position to the right side of her lane.

12 Then a secondary imminent hazard presented
13 itself, which is the decedent actively bending over into
14 her path with his head directly into her path where it
15 wasn't there before. That is the hazard I don't have any
16 information on to quantify, so I am unable to perform an
17 avoidance analysis on that, because I don't know when he
18 bent over. What I can tell you is that the timing of
19 that movement was likely short, and the available time
20 and distance required to avoid that was likely greater.

21 Q. So I guess my question is, You didn't perform
22 an analysis on how long it would have taken Caylee to
23 brake to either come to a complete stop or significantly
24 reduce her speed once she saw the Toyota, did you?

25 A. That is not a relevant analysis, because we



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1 don't see people doing that in the literature. We don't
2 see people locking up their brakes due to the presence of
3 a roadside vehicle.

4 A good example I always like to ask is when
5 is the last time you locked up your brakes and said,
6 "Oops, never mind"? We don't respond in an emergency
7 fashion unless the hazard is certain and imminent.
8 Anything else, we classify as a potential hazard that
9 just requires some form of an adjustment.

10 Q. So now, in this case, the car wasn't on the
11 shoulder entirely, right? I mean, the car was partially
12 in the lane of travel she was in.

13 A. About 2 feet.

14 Q. Okay. So you didn't think it was necessary
15 to perform an analysis of how long it would take her to
16 slow down when she saw a lane -- when she saw a car
17 parked in her lane of traffic on the interstate?

18 A. Well, you say "parked." It's not parked in
19 her lane. So it is partially obstructing her lane.
20 There is a totally different analysis, totally different
21 visual stimulus if a vehicle is obstructing her entire
22 lane versus partially obstructing her lane where she can
23 physically navigate through the gap.

24 We don't have an imminent hazard here that
25 requires an emergency response. Again, we reserve



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1 emergency responses for emergency imminent hazards,
2 because there's risks associated to implementing a
3 response. Locking up your brakes on a freeway is risky
4 due to traffic behind you, so you're going to reserve
5 that for the absolute necessary.

6 In a potential hazard where your lane may
7 just be minimizing width by a couple feet, that doesn't
8 require locking up the brakes. That just requires
9 adjusting your lateral position to navigate successfully
10 around that vehicle. And that's exactly what she did.

11 Q. So because you're categorizing the parked
12 Toyota in the lane as a potential hazard and not an
13 imminent hazard, that's why you didn't perform a braking
14 analysis for Caylee?

15 A. Well, it's -- there's a couple explanations.
16 So yes, number one, it was not an imminent hazard; it
17 didn't require an imminent response. We don't see
18 drivers locking up their brakes for roadside hazards.
19 That's just not something drivers have been shown to do.
20 So applying that analysis would be unfair because we are
21 comparing what the literature and the studies actually
22 show drivers doing versus what actually happened. And
23 that's not what the studies show that drivers do.

24 Number two, we do see drivers adjusting their
25 lateral position to that type of hazard, and that's what

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1 Caylee did. So she is consistent with what the
2 literature shows of what an attentive typical driver
3 does, not only in her actual movement, but the magnitude
4 of her movement to -- when facing this particular
5 potential hazard.

6 Q. Well, so my question is, Because of the
7 literature that you reviewed and the way you categorize
8 the hazard created by the Camry, that's why you didn't
9 conduct a braking analysis, right?

10 A. I think that's fair, because it's not
11 applicable. That would be like performing a braking
12 analysis to a threat that is not consistent with the
13 research. We have to compare apples to apples. So if
14 I'm going to apply a perception response time to a
15 driver, I have to compare that perception response time
16 to a similar hazard, because perception response times
17 change drastically based on the visual hazard.

18 They can be very short, or they can be very
19 long based on the characteristics of the visual hazard.
20 So we really need to compare apples to apples to properly
21 apply a perception response and avoidance analysis to our
22 subject driver.

23 And that's what I did here was I compared
24 apples to apples of what the actual hazard was to what
25 the research shows drivers doing to that actual hazard.

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1 If I applied any other avoidance analysis, it would be
2 improperly applying the facts of the case to this
3 particular case, because that's not what we have.

4 Q. So it's your expert opinion that a driver in
5 Caylee's position would not apply the brakes or slow down
6 when they -- as they approached a vehicle partially
7 stopped in their lane?

8 A. Well, that question is a little different.
9 You said "slow down." We were talking about emergency
10 braking, coming to a complete stop before.

11 Q. I think you were talking about emergency
12 braking. So let's talk about slowing down, all right?

13 A. Okay.

14 Q. So is it your expert opinion that a driver
15 will not slow down as they approach a vehicle partially
16 stopped in their lane?

17 A. That is not my opinion. My opinion on this
18 particular hazard is that studies show drivers will
19 typically slow down by 1 to 3 miles per hour, is what the
20 cumulative studies show that drivers will reduce their
21 speed by a few miles per hour, and possibly adjust their
22 lateral lane position if necessary.

23 We see Caylee reducing her speed by at least
24 4 miles per hour. We had her speed at 90, then at 86,
25 and then there was a gap before impact, so there very



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1 well could have been additional speed reduction below 86.

2 So she did a speed reduction of at least
3 4 miles per hour and moved laterally by over 2 1/2 feet
4 in her lane, which the studies show the average driver
5 will move about 1.7 feet laterally in their lane to a
6 roadside vehicle and pedestrian in one. So we see she
7 did exactly what the literature says the average
8 attentive driver does: They slow down and they move
9 over.

10 Q. So did you cite the papers that you're
11 referring to in your report?

12 A. The papers, I believe, are actually cited in
13 there. I also included them on your thumb drive.

14 Q. Okay. Now, Caylee's speed reduction
15 occurred -- and don't let me put words in your mouth --
16 one to two seconds before she struck Nehemias?

17 A. I don't know the exact timing, but I think
18 two seconds would be fair.

19 Q. And is that -- does the literature support
20 that about two seconds before you strike someone is when
21 a driver will conduct the speed reduction that you're
22 referring to?

23 MR. DUBOFF: Objection to the form.

24 A. It is consistent, because what the research
25 shows is that drivers typically will take their foot off



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1 the gas pedal. And so that speed reduction is as a
2 result of the timing of releasing the gas and slowing
3 down by 1 to 3 miles per hour. So arguably, she actually
4 implemented her response sooner than the average driver
5 in the research, because she reduced by 4 miles per hour
6 by simply letting go of the gas.

7 Q. So you didn't -- did you offer an opinion
8 about Caylee's speed in this case?

9 A. I provided an opinion of what her speeds
10 were, of course.

11 Q. Okay. Do you think that her speed was a
12 relevant contributing factor to the collision?

13 A. On an avoidance standpoint, no, because speed
14 is a contributing variable when we can establish a
15 baseline of when the hazard presented itself and compare
16 that distance to the required distance to avoid at both
17 the subject speed versus the speed limit. I don't have
18 the time at which the hazard presented itself.

19 Q. So would it be fair to say that since you
20 don't know when what you're calling the hazard presented
21 itself, you don't know if her speed was a relevant
22 factor?

23 A. I certainly cannot make a calculation in this
24 particular case, because I don't have enough information.

25 Q. Okay. So do you agree that, all the other

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1 facts unchanged that -- that you're aware of, the crash
2 would not have occurred if Caylee Smith was traveling the
3 speed limit?

4 A. Can you repeat that question?

5 Q. Do you agree that, all other facts unchanged,
6 that if you had -- if Caylee Smith had been traveling the
7 speed limit, this crash would not have occurred?

8 A. I cannot say that.

9 Q. Have you published any papers?

10 A. I have.

11 Q. Okay. What are they about?

12 A. It's been a while. I know the first couple
13 of papers I published were based on my academia graduate
14 research. I have published a paper in accident
15 reconstruction about video analysis, analyzing pedestrian
16 impacts to vehicles using photogrammetry analysis to
17 calculate distances from those videos and from
18 photographs. I believe that's probably the most relevant
19 literature that I've published. I'd have to go back to
20 my CV and see all the other --

21 Q. Sure.

22 A. -- literature.

23 Q. My understanding is you've published on the
24 reconstruction of accidents using video evidence, right?

25 A. Yes. And photogrammetry, really.



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1 Q. Photogrammetry, which -- and can you tell us
2 what photogrammetry is?

3 A. Photogrammetry is a scientific method for
4 calculating distances from either photographs or videos
5 using known values within the photograph or video
6 establishing vectors or lines from a camera to those
7 known objects in the environment which fixes the camera
8 in space, and then doing that same process to establish
9 and calculate the unknowns in the video like final rest
10 positions or fluid stains, volatile evidence using that
11 same ray-vector analysis to then reverse engineer the
12 positions of other objects.

13 Q. So just to use a simple example, if, like,
14 there was a pitcher of water on the road that's going to
15 evaporate, a volatile substance, right?

16 A. Correct.

17 Q. And you could measure some things in that
18 photo by going to the scene, like two trees, right, you
19 calculate that distance and then using some engineering
20 magic, you can then figure out exactly where the water
21 was located?

22 A. Yeah. I don't refer to it as "engineering
23 magic," but I do like that now that --

24 Q. Sure, sure.

25 A. -- you've said that.



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1 But it's like triangulation of satellites.
2 It's the same concept. You're triangulating known points
3 to establish positions.

4 Q. Okay.

5 A. When you have enough known points, you can
6 fix the camera in the environment and extract other
7 unknowns.

8 Q. Now, photogrammetry is not perfect, right? I
9 mean, it's not as perfect as, say, laser scanning a scene
10 immediately after it happened, right?

11 A. It depends. Every project has different
12 tolerances based on the available data you're working
13 with, the resolution of the photographs, the amount of
14 photographs, the amount of knowns that you're working
15 with. So it depends; every project is different.

16 In this particular case, I did establish my
17 error rate or tolerance to these measurements. That is
18 one large process of photogrammetry is understanding how
19 accurate these points are.

20 Q. And is the error rate uniform for every
21 photogrammetry calculation you make, or is it actually
22 different for every particular photogrammetry calculation
23 that you do?

24 A. It will be based on the area in the photo
25 that you are analyzing.



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1 Q. Okay. So every photo could be different?

2 A. It could.

3 Q. Okay. Do you have -- can you just tell us
4 for the record what the error rate is on the
5 photogrammetry that you did in this report?

6 A. Yes. Let me reference my report. So my
7 computer turned off.

8 THE WITNESS: Can we go off the record?

9 THE VIDEOGRAPHER: The time is 10:56 a.m.,
10 and we are off record.

11 (Break was taken from 10:56 a.m. to
12 11:02 a.m.)

13 THE VIDEOGRAPHER: The time is 11:02 a.m.,
14 and we are on record.

15 BY MR. WHITE:

16 Q. So we just took a little break. I think we
17 were in the middle of talking about your error rate on
18 your report, and you were looking it up.

19 A. Yes. So you are correct: The error rate
20 will be different based on what measurement I'm taking
21 within the photo. What I like to do is establish the
22 maximum error in all of the photos and all of the
23 measurements so I know that everything is less than that.
24 In this particular case, my maximum error or tolerance or
25 accuracy was plus or minus a quarter of an inch on all of



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1 my measurements.

2 Q. Okay. All right. So -- and I'm not an
3 engineer. Would you call that a half-inch error rate, or
4 would you call it a quarter-inch error rate? Because it
5 could be a quarter inch in either way, so summed up, it's
6 a half inch. Well, what would you call it?

7 A. Plus or minus a quarter of an inch. So it
8 could be a quarter of an inch less than what I'm
9 reporting or a quarter of an inch more than what I'm
10 reporting.

11 Q. Okay. Got it. Thank you.

12 So do you speak on the issues of accident
13 reconstruction at, say, industry conferences?

14 A. I have presented at a few, yes.

15 Q. Okay. Can you tell us about those
16 presentations?

17 A. May I reference my CV?

18 Q. Yes.

19 A. So it looks like I have presented at various
20 seminars about eight times over the last ten years. My
21 most recent was back in 2021.

22 Q. Okay. So and the 2021 presentation was
23 called "Evidence Collection Technology and Digital Data
24 Sources in Forensic Engineering Reconstruction"; is that
25 right?



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1 A. Yes.

2 Q. Okay. Do you remember what the topic of --
3 or do you remember the substance of that presentation?

4 A. Oh, goodness. I don't know with certainty;
5 but vaguely, I believe that was demonstrating all of our
6 available tools that we have to collect evidence: laser
7 scanners, cameras, drones, photo scanning, all the latest
8 and greatest technology that we use in the industry.

9 Q. Okay. And if you can go down, it looks like
10 you gave a presentation -- or sorry. Strike that.

11 It looks like you gave a presentation in 2016
12 titled "Maintenance of Traffic and Roadway Design
13 Analysis"; am I correct?

14 A. Yes.

15 Q. Do you remember what that presentation was
16 about?

17 A. That was more of an exhibit with my
18 colleagues on -- more a transportation engineering aspect
19 of the environmental aspect about the case, the roadway
20 design, curvatures, radiuses, elevation changes, widths,
21 things like that.

22 Q. Okay. So can I assume that you're familiar
23 with, like, federal DOT or rules regarding traffic
24 maintenance, or is that not your expertise?

25 A. That starts to go outside of my expertise as



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1 far as Department of Transportation standards for roadway
2 design.

3 Q. Okay. You are a human factors expert,
4 though, right?

5 A. Yes, as it involves the driver and human
6 aspect of an accident reconstruction. It's always worth
7 mentioning, human factors is a very large field which
8 includes things like designing the ergonomics of this
9 chair that I'm sitting in, designing the location of
10 buttons in your vehicle. It's a very broad field.

11 And the expertise that I hold is under the
12 accident reconstruction/transportation umbrella, which is
13 driver performance -- and I should say, really, human
14 performance, because that includes pedestrians and
15 passengers -- in response to hazards in the
16 transportation environment. So not only what have
17 drivers done, but quantifying the performance of those
18 avoidance movements.

19 Q. So would you agree that traffic maintenance
20 involves analyzing how humans interact with traffic?

21 A. I would imagine there is some human factors
22 component to transportation engineering design, certainly
23 with understanding how drivers respond to various
24 signage, the locations of the signs. I think I can agree
25 with that, yeah.



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1 Q. Okay. So do you take continuing education
2 classes?

3 A. Yes. They require a certain amount of
4 continuing education to maintain my professional
5 engineering license as well as my accident reconstruction
6 accreditation from the ACTAR committee.

7 Q. How often do you have to take continuing
8 education?

9 A. I don't remember the standards, because I end
10 up taking way more than I need. I typically -- I take at
11 least two courses a year.

12 Q. Okay. Since you graduated with your master's
13 degree, have you always worked for Focus Forensics?

14 A. I've always worked in the accident
15 reconstruction realm for the same boss. But Focus
16 Forensics established in 2014. It branched off of
17 Armstrong Forensic Engineers, which is the company I
18 started with in 2013. So I've had the same boss for
19 11 years; it's just now a different company name.

20 Q. Okay. So have you or folks -- excuse me.
21 Have you or Focus Forensics ever worked previously,
22 before this case, for the law firm of Freeman Mills or
23 McGuireWoods?

24 A. That sounds familiar, McGuireWoods, yes. I
25 am very bad with names, so I apologize if I don't



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1 remember something.

2 Q. So let's take them one at a time. Have you
3 or your -- or your firm that you work for, have you ever
4 previously been retained by Freeman Mills, the law firm?

5 A. Is that the same law firm as McGuire?

6 Q. No. It's different. That's the law firm in
7 Texas in this case.

8 A. Okay. And then I guess my answer is, I don't
9 know.

10 Q. Okay. But you do think that your firm or you
11 have been retained previously by McGuireWoods?

12 A. Yes.

13 Q. Okay. Do you know how many times?

14 A. I don't have that readily available or even
15 if it's documented anywhere, but I would guess less than
16 five. I don't know.

17 Q. Do you recall which cases those five were?

18 A. I'm so bad at remembering this, I don't.

19 Q. Okay. Do you remember if those were defense
20 cases, plaintiff cases?

21 A. I think they're a defense law firm, so
22 presumably defense.

23 Q. Okay. Have you ever -- or Focus Forensics,
24 to your knowledge -- ever done work for Eastman Chemical
25 Company before?



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1 A. That's the underlying carrier underneath?
2 Yeah, I don't know. It's more so I don't know for that
3 question because we don't always know the underlying
4 carriers. We are retained typically by counsel,
5 sometimes the insurance companies, so I don't always know
6 the hierarchy of involved entities.

7 Q. Okay, okay. What hourly rate are you billed
8 out at?

9 A. 2023, Focus Forensics is charging \$280 per
10 hour for my standard time and I believe \$400 per hour for
11 my testimony, but let me double-check that. Yes, I was
12 correct: \$280 per hour for standard time, which is
13 engineering analysis, inspections, travel to and from
14 locations; and then active testimony like depositions or
15 trial testimony is billed at \$400 per hour.

16 Q. Okay. But you actually are not paid by the
17 hour; you receive a salary?

18 A. Correct. I'm a salaried employee by the
19 engineering firm.

20 Q. Okay. And what is your salary with Focus
21 Forensics?

22 A. I am not able to disclose that information.

23 Q. Are you refusing to give that answer?

24 A. Yes, I am.

25 Q. On what basis?



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1 A. That is confidential. It has no basis for
2 the engineering work performed in this case. It has no
3 relevancy to the facts of the case or my engineering
4 analysis. My income is irrelevant of anything related to
5 this legal case, regardless of the outcome of the case,
6 regardless of my findings. My salary has no basis for
7 anything involving my work performed on this particular
8 case. It is also confidential. I am instructed by my
9 employer to not disclose that.

10 MR. WHITE: So are you instructing him, Greg,
11 not to answer that question?

12 MR. DUBOFF: I mean, it's not privileged, but
13 I'm not going to tell him to answer it. And if
14 he -- I guess I'm not going to tell him to
15 disregard what his employer has told him. If you
16 want to have a fight about it with the judge, then
17 we can do that.

18 MR. WHITE: Okay. So fair enough. Right.

19 BY MR. WHITE:

20 Q. Just for the record, you're not going to
21 answer that question based on your opinion that it's not
22 relevant and your employer's instruction?

23 A. That's correct.

24 Q. Okay. How much has Focus Forensics billed
25 the defense in this case as of today?



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1 A. The last I looked when I added all the
2 invoices, it was just under \$15,000.

3 Q. Okay. Did Defense Counsel give you any
4 assumptions to use --

5 MR. DUBOFF: And again, Jacob -- I mean, I
6 can do it at the end. But if you just want to
7 clarify, I know he -- I know Mr. Montalbano just
8 said it, but if you want to ask -- if we're going
9 to have a fight about this, I'd rather just have a
10 complete record if you want to ask him about
11 whether there's any contingency to any -- if his
12 salary is based in any way on anything having to do
13 with this case.

14 MR. WHITE: Okay, yeah, let's get that out of
15 the way just so we don't have to revisit it down
16 the road.

17 BY MR. WHITE:

18 Q. Is your salary with Focus Forensics
19 contingent on any outcomes of any of the cases that you
20 work on?

21 A. Absolutely not. And that's why it's not
22 relevant, and that's why I'm instructed not to provide
23 it, because it has absolutely no relevancy to the
24 engineering work I perform. I'm a salaried employee. We
25 charge hourly. Even Focus Forensics' income is



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1 irrelevant of the outcome of the case, whether it's good
2 or bad for the retaining counsel that retained us.

3 We charge hourly for the time it takes us to
4 perform the work. So the outcome of cases, the type of
5 analysis that I'm performing is entirely irrelevant to
6 not only Focus Forensics' income but my personal salary
7 with the employer I work for.

8 Q. So do you receive -- and I'm not asking you
9 an amount. Do you receive a bonus at any point?

10 A. There is a bonus structure based on
11 efficiency.

12 Q. Okay. Do -- and otherwise, you're generally
13 paid as a salaried employee, which I take it means you
14 receive the same amount every month or whatever the pay
15 schedule is?

16 A. Correct.

17 Q. Okay. Do you own equity in Focus Forensics?

18 A. No.

19 Q. Do you own equity in any entity that owns a
20 portion of Focus Forensics?

21 A. No.

22 Q. Okay. Did Defense Counsel give you any
23 assumptions to use in your report in this case?

24 A. Not that I can think of. If there were
25 assumptions that I relied upon, I would have presented



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1 them in my report.

2 Q. Okay. And we'll go through your report here
3 in a little bit.

4 Do you remember any assumptions that you
5 made?

6 A. Everything I do typically relies on the
7 physical evidence and mathematical calculations.
8 Certainly, there is conflicting testimony that I'm aware
9 of that I have considered, so technically, those can be
10 regarded as assumptions that I've considered. But I
11 certainly try my best to establish -- if I'm relying on
12 testimony or an assumption, then I will say it.

13 Q. Have you made any credibility determinations
14 when reviewing witness statements to determine which set
15 of facts you're applying to this accident?

16 A. Fortunately, that's not my job. I'm not
17 allowed to do that. I consider all testimony entirely
18 and compare it directly and objectively to the physical
19 evidence and the physics involved. It's up to the jury
20 to determine credibility.

21 Q. What do you do when one witness provides
22 contradictory or inconsistent statements when generating
23 a report?

24 A. I will mention it that their testimony or
25 statement is inconsistent with the evidence or the



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1 calculation, whatever engineering foundation that I have
2 to compete against their testimony.

3 Q. Okay. Do you recall in this report ever
4 mentioning whether some -- whether the one witness
5 provided different inconsistent statements?

6 A. I believe there's a lot of inconsistent
7 statements. I think you'll need to be more specific on
8 that.

9 Q. Well, yeah. I'm talking about when one
10 witness -- like, the same person -- says one different --
11 different things at different times, contradicting
12 themselves.

13 A. I would need an example. I know that, just
14 on my experience, particularly when witnesses are deposed
15 by attorneys that ask questions in varying types of way,
16 and in varying types of way, sometimes the answer could
17 be slightly different depending on how it's asked.
18 You'll have to be more specific; I'm not sure.

19 Q. Okay. But you don't recall mentioning
20 inconsistent statements where someone contradicted
21 themselves in your report?

22 A. Yeah. It's not something that I need to
23 bring forth to the jury. They are capable of finding
24 those inconsistencies. What my job is is to analyze
25 everything as a whole and compare it to the evidence.



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1 Q. And as far as you know, you haven't picked
2 amongst any individual witnesses' inconsistent statements
3 and chosen which statement you relied on?

4 A. Correct. I don't choose what I rely on in
5 regards to testimony, because it's obviously in dispute.
6 Now, what I can establish is whether it's consistent with
7 the science or not. And that's really how I can assist
8 the jury in helping them resolve that dispute in any
9 inconsistencies, not only in the same witness but also
10 between other witnesses.

11 Q. Okay. Thank you.

12 So you said earlier you were retained on --
13 or Focus Forensics was retained on August 26, 2023,
14 right?

15 A. I thought it was April, but let me
16 double-check.

17 Q. Oh, I'm sorry. I may have my A months mixed
18 up.

19 A. April 26, 2023.

20 Q. Okay, perfect. Thank you.

21 When did you start engaging in work in this
22 case?

23 A. Let me reference the first invoice. Looks
24 like I charged a half hour for intake of case materials
25 on April 26, 2023.



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1 Q. Okay. And can you describe -- well, strike
2 that.

3 Did you or anyone at your firm physically
4 inspect the Ford Explorer in this case?

5 A. No. We -- or I should say I relied on the
6 inspections that were performed by others.

7 Q. Okay. And do you know who performed the
8 inspections that you relied upon?

9 A. There were two companies. One company had a
10 name change. So CAC is now Aperture, I believe; and then
11 there's Axiom Engineering.

12 Q. And fair enough. Axiom is the accident
13 reconstruction company that Plaintiffs' side has hired.

14 So you relied upon the photos and everything
15 else that Axiom took of the Ford Explorer as well as --
16 let's call it CAC for now. Those are what you relied
17 upon, right?

18 A. Yes. I relied on their inspection materials,
19 the same as I rely on the inspection materials of my
20 colleagues that assist me in inspections that are more
21 local to the physical location of the inspections. It's
22 a very common thing in our industry to have assistance
23 with inspections to keep costs down so that way we're not
24 traveling so far. We're scattered throughout the state
25 on purpose, so that way we can be efficient in collecting



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1 evidence.

2 Q. And can we agree, if I say "CAC" or
3 "Aperture," we agree that's the same thing?

4 A. Yes.

5 Q. Okay. So do you know when CAC performed the
6 physical inspection of the Ford Explorer?

7 A. I do have the date in my report, if I can
8 reference that. And I'm sorry. That was the inspection
9 of the Ford, you asked?

10 Q. Yes. And if you don't know, I mean, that's a
11 perfectly --

12 A. I don't know off the top of my head. I can
13 certainly search the report. I do believe it's in there
14 though.

15 Q. Okay. Does -- if I tell you that it happened
16 sometime in September of 2022, do you have any reason to
17 contradict that?

18 A. No. I actually just found it: September 6,
19 2022.

20 Q. Okay. And do you know what CAC did to
21 inspect the Ford Explorer?

22 A. They photographed it, laser scanned it, and
23 performed an ACM download and an infotainment system
24 download.

25 Q. Okay. So you're relying -- and correct me if



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1 I'm wrong. Are you relying on the photos and scans done
2 by CAC?

3 A. In part, yes. That is part of the puzzle
4 pieces I was provided to paint the picture of what
5 happened.

6 Q. Okay. So how did you verify the accuracy of
7 CAC's photographs and laser scanning?

8 A. The photographs appear to not be tampered
9 with; they were consistent with both companies'
10 inspection photographs of the Ford, Axiom and CAC. The
11 accuracy of the laser scanning, actually, I relied on
12 what's called their photo scans, which is a series of
13 photographs that they take walking around the vehicle,
14 and I can stitch those photographs together to establish
15 a 3D model and generate those error rates myself so I can
16 know the accuracy of that model on my own. So I
17 processed their photographs in a 3D model of the Ford
18 myself.

19 Q. So what software did you use to generate the
20 3D model?

21 A. Pix4D.

22 Q. Okay. So you did the Pix4D analysis; you did
23 not receive one from CAC?

24 A. That is correct.

25 Q. Okay. So when someone else -- well, strike



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1 that.

2 Is it your practice to typically allow
3 someone else to do the vehicle inspection and then rely
4 upon those photos?

5 A. Quite common.

6 Q. Okay. Is it your regular practice to allow,
7 like, a totally unrelated entity unrelated to Focus
8 Forensics to do the initial inspection?

9 A. Actually quite common, yes. We subcontract
10 other engineering companies out often that are closer to
11 the inspection locations.

12 Q. Okay. Have you or your firm or anyone from
13 your firm done a site visit on Interstate 45 where this
14 collision occurred?

15 A. Not personally. Certainly, by the time we're
16 retained, all the evidence is gone. The site was
17 thoroughly documented, both photographically and by drone
18 mapping shortly after the crash. I believe it was six
19 months after.

20 Q. Do you -- do you know who did the drone
21 mapping?

22 A. I believe that was CAC.

23 Q. Okay. So just to -- just to be certain, no
24 one from Focus Forensics has been to the scene of this
25 accident?



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1 A. Correct.

2 Q. Okay. Now, you said that there was an ACM
3 download and an infotainment download done by CAC --

4 A. Yes.

5 Q. -- right?

6 A. Let me rephrase that. I think there was some
7 cooperation between Axiom and CAC with the downloads, so
8 I don't know specifically who plugged into it, but there
9 was -- it was teamwork.

10 Q. Fair enough, right? That's not a trick
11 question, right?

12 Have you reviewed -- well, I guess I
13 should -- let me back that up.

14 What have you reviewed from ACM in the
15 infotainment center download?

16 A. All of it.

17 Q. Okay. So when you say "all of it," with
18 respect to the infotainment module, what do you mean?

19 A. There was various types of data. There was,
20 most notably, the breadcrumb trail of the Ford and the
21 40 miles, I believe, leading up to the collision location
22 at one-second intervals providing speed, bearing, and GPS
23 coordinates. There was also text and call records that
24 were recorded through the Bluetooth connection of
25 Caylee's phone to the infotainment system. There was



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1 some other GPS reported information such as vehicle
2 starting points and synchronized clock points, but those
3 were part of the peripheral information.

4 Q. Who provided you with the infotainment center
5 download?

6 A. I believe it came from my client.

7 Q. Okay. So when you say "from the client," you
8 mean Defense Counsel?

9 A. Yes.

10 Q. Fair enough.

11 So the infotainment module data that you
12 reviewed, does it only include, like, say, two hours
13 before the collision? Is that what -- that's the version
14 you've looked at?

15 A. I believe two hours sounds right. It
16 certainly has limited memory, so I believe that was all
17 it had was two hours or 40 miles. I'd have to reference
18 the report for the exact numbers.

19 Q. So -- and just to get super specific, it was
20 a report that you reviewed, and it's a PDF that, like,
21 has rows showing each track log point? Is that what
22 you've looked at?

23 A. That is one of the files that was provided,
24 yes.

25 Q. Were there other files that you were



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1 provided?

2 A. I think there was a .CSV file, which is an
3 Excel table --

4 Q. Okay.

5 A. -- on those data points.

6 Q. Do you know if that was generated from the
7 infotainment module, or if that was something separate?

8 A. That was from the infotainment system.

9 Q. Okay. Any other files that you reviewed from
10 the infotainment center?

11 A. Since you're getting specific, let me go
12 ahead and open up that folder just to correctly answer
13 this question. So yes, there are two files related to
14 the infotainment system data. There was a PDF titled
15 "Berla Report"; and then there was a .CSV file titled
16 "Berla Download Track Points."

17 Q. And is this -- is this part of what you've
18 given me on this thumb drive?

19 A. It is on there.

20 Q. Can you just kind of walk me through -- I can
21 get there. Is that in the download data folder?

22 A. Yes. So under "Materials Received," then
23 under "Download Data," then under "Ford Explorer," then
24 under "Infotainment Data."

25 Q. Got it, got it. Okay.



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1 So do you know, from your review of the
2 infotainment center, infotainment center module --
3 whatever we're calling it -- do you know where
4 Caylee Smith went the morning of April 30, 2022?

5 A. I do recall mapping that on a map. I don't
6 have that teed up off the top of my head, so I'd have to
7 go back and look at those GPS coordinates. But it -- I
8 vaguely remember it was some type of plaza with shopping
9 plazas and restaurants maybe. I'm not sure.

10 Q. Okay. So do you recall that she -- she
11 started the Ford Explorer that morning in -- at her home
12 in Livingston?

13 A. I recall seeing it started at an address,
14 then it went to some commercial property parking lot, and
15 then on its way to the crash location.

16 Q. So do you recall that one of the locations
17 she went to was a hotel in Houston?

18 A. I didn't get that detailed to know if it was
19 a hotel. I'd have to recheck those GPS points. I was
20 more focused on the actual crash.

21 Q. Okay, okay. So how do you derive speed data
22 from the infotainment center module that you were given?

23 A. How do I, or how does it do that?

24 Q. Well, let's start with you. Tell me how you
25 derive speed data. And I ask that question because it



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1 looks like from the PDF and -- the PDF and the Excel that
2 it doesn't explicitly have the speed data.

3 A. So the PDF and Excel file were -- did provide
4 various types of data. The PDF only provided the GPS
5 coordinates with actions, then that was under the events.
6 Then under Track Points, it provided GPS coordinates with
7 bearing data, which is the orientation of the vehicle
8 relative to north. Then the .CSV file is what contained
9 the speed data.

10 Q. Okay.

11 A. So I had to actually combine the two.

12 Q. Okay. So now, from the PDF file, which was
13 all Plaintiffs' Counsel was originally provided, for
14 every track point, it tells you the distance that she
15 went in a second, right?

16 A. Yes.

17 Q. And if you know how many feet someone
18 traveled in a second, you can derive their speed as a
19 mile per hour, right?

20 A. Yes. That is all GPS-based though. It's
21 just the point at two positions when the GPS pinged it.
22 The speed data in the CSV file, my understanding is it's
23 pulling it from the CAN bus, and that's the actual
24 network from the vehicle reporting the speed.

25 Q. Okay. All right. So then -- and that's the



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1 information we need.

2 So the speed column on the .CSV file is not a
3 GPS derived speed; it is directly pulled from, I guess,
4 the altimeter on the Ford Explorer?

5 A. That is my understanding of infotainment
6 system data is that it is pulling the data from the
7 vehicle.

8 Q. Okay, okay. Thank you.

9 So have you ever done a -- or strike that.

10 Have you ever used Berla to pull data and run
11 a report off of an infotainment center?

12 A. Yes. It's costly, so it's not as frequent as
13 your traditional black box download. But yes, it is a
14 rather large part of our industry now with this
15 technology in these vehicles.

16 Q. Okay. So can you walk me through -- say a
17 client asks you, "Hey, we want to download the data from
18 the infotainment center. Use Berla and run a report."
19 Have you done that?

20 A. So we actually outsource the physical
21 downloading process. The software and equipment is
22 rather expensive, and the times when we actually need the
23 data is far and few between, because we typically will
24 rely on the standard black box download --

25 Q. Okay.



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1 A. -- that gives us a much higher resolution
2 around the crash time, which is what we're actually
3 focused on. So anytime that we want to get Berla data, I
4 will outsource it to a company to download for me and
5 then provide me the data.

6 Q. So you don't have any personal experience
7 running a report using Berla?

8 A. Not the physical extraction. It does require
9 training through Berla to be able to do that with their
10 equipment.

11 Q. So separate from the physical extraction,
12 have you ever used Berla to generate a report based on a
13 download from an infotainment center?

14 A. So not to be nitpicky, but you used the word
15 "report" again.

16 Q. Yeah.

17 A. Yes, I have -- well, I've used infotainment
18 system data many times in accident reconstruction
19 analyses. I don't know if it's ever made it to a
20 physical hard paper report.

21 Q. Okay. Well --

22 A. It's like I said --

23 Q. Yeah, yeah, fair enough, right? And I don't
24 care if it was physical hard copy or not.

25 What I'm trying to figure out is, Have you



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1 ever used Berla to interpret the data that's pulled off
2 of a module in order to figure out, for example, GPS
3 coordinates or speed?

4 A. Yeah.

5 Q. Okay. Can you walk me through what that
6 process looks like?

7 A. Yeah. It's the same process I utilized in
8 this case. It's I look at the data. In this case, it
9 was provided in two different formats, an Excel file and
10 a PDF, both containing various types of information. The
11 Excel file has speed --

12 Q. Well, sorry. That's actually not what I'm
13 asking. I'm not -- I don't think you're being
14 disingenuous; I think we're just misunderstanding each
15 other.

16 Before you get the PDF and the Excel, have
17 you ever been part of the process to generate the PDF and
18 the Excel report using Berla?

19 A. Oh, no. That's part of the extraction
20 process.

21 Q. Okay.

22 A. That's what we outsource.

23 Q. Okay. You outsource that bit. Okay. Sorry.
24 That's -- we were just a little confused there.

25 So I just want to make sure: So physical



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1 extraction of the data and the creation of the PDF or the
2 Excel, whatever file interprets the data, that all
3 happens at the same time?

4 A. My understanding, yes.

5 Q. Okay.

6 A. I believe it's a very lengthy process, or it
7 could be.

8 Q. Okay.

9 A. Some of these downloads can take 24 hours of
10 straight downloading, so they'll often run them
11 overnight.

12 Q. And your understanding is that either CAC or
13 Axiom did the extraction in this case?

14 A. Yes.

15 Q. So you were provided -- you actually got the
16 PDF and the Excel from the infotainment center from
17 Defense Counsel in this case, right, not from CAC?

18 A. Yes, I believe everything went through
19 Defense Counsel. I have not had any direct communication
20 with other engineering firms.

21 Q. Okay. So what information can you get off of
22 a SYNC Generation 3 infotainment module?

23 A. So that's a very specific question with a
24 very specific generation that will have a different
25 answer versus other manufacturers and other generations



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1 of those manufactures. So that's not something I have
2 teed up off the top of my head. I'd have to go reference
3 the Berla reports that tell you the manufacturer and
4 generation, what to expect. They're all different, just
5 like black box data.

6 It's hard to answer a blanket question of
7 what type of black box data you would get from an air bag
8 control module, because it's different for every year,
9 make, and model. Same thing for Berla: It's going to be
10 different for every year, make, and model. I would have
11 to go reference the reports.

12 Q. So I -- so the data that gets pulled is
13 different by make, model, and generation of the
14 infotainment center, if I understand your answer right?

15 A. Could be, yes.

16 Q. Okay. So have you studied the specific
17 accuracy of the data pulled from this type of
18 infotainment module from this Ford Explorer?

19 MR. DUBOFF: Objection to the form.

20 A. Yes. There is actually a paper specifically
21 to this generation of the module validating the accuracy
22 of the data.

23 Q. Okay. So when you -- and do you remember who
24 authored that paper?

25 A. I'd have to reference it in my file. I don't



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1 have that teed up.

2 Q. Was it Wes Vandiver?

3 A. Again, I'd have to -- can I reference it?

4 Q. Sure, sure.

5 A. Yes. I have three papers. Two of those are
6 from Wesley Vandiver. One is from William Bortles.

7 Q. Okay. So do you recall what the error rates
8 are on the GPS data from a SYNC Generation 3 infotainment
9 module?

10 A. Are you talking about the speed data or the
11 GPS coordinate accuracy?

12 Q. The GPS coordinate accuracy.

13 A. Looks like plus or minus 5 meters.

14 Q. So I guess, let's use your engineering magic
15 for an American audience. Plus or minus 5 meters, how
16 many feet is that?

17 A. So I referenced this in my report. What I
18 ended up doing was actually combining all three of these
19 papers and their reported accuracy of these GPS points to
20 give a range. This range is going to heavily rely on
21 various environmental components like number of satellite
22 dishes that are connected, any environmental physical
23 obstructions like buildings or trees. Even speed of the
24 object can affect that.

25 My report, I believe, indicated a 3- to



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1 7-foot accuracy, but let me double-check that. Yes, 3.5
2 to 7.5 range in accuracy of the global position of the
3 GPS coordinate. Now, that is the global position based
4 on the general environment that you're in at the time of
5 the evidence or sample collection.

6 What you can do is establish more certainty
7 within that data by doing a relativity analysis, where if
8 we know a sample of points were taken in the same
9 environment, the global offset of all of those points are
10 generally going to be the same and have the same error
11 rate relative to global positioning.

12 And what we can do is track the difference
13 between those individual sample points that were taken
14 very close in time together within the same environment,
15 within the same speed, within the same settings that were
16 individually collected to further analyze whether there's
17 any change in the subsequent events or points to see if
18 we can track trends, and we can more heavily rely on the
19 accuracy of those trends versus the global accuracy of
20 the points.

21 Q. So -- and tell me if I'm wrong about this.
22 If I convert that into layman's terms, are you saying
23 that you look at the different GPS track points, and
24 if -- as long as they look more or less like they're --
25 like, there's not one that's weirdly, like, you know,

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1 20 feet off or something in what is otherwise a straight
2 row, you -- you would understand that to mean that the
3 track points are generally accurate?

4 A. Yes. If they are collected in the same
5 environment and generally the same conditions, you could
6 form trends from a cluster of GPS points to establish the
7 accuracy relative to the prior points, so the theory of
8 relativity. The global accuracy, yes, 3 to 7 feet, 3 to
9 8 feet. But the theory of relativity says that if you
10 take a sample point close in time to the prior sample
11 point, you can assume the same accuracy within each of
12 those subsequent points and rely --

13 Q. Relative to the prior one?

14 A. Yes.

15 Q. So for example, if you see a bunch of GPS
16 track points from this infotainment module and they're
17 all in a straight line, you take that to mean the vehicle
18 was going in a straight line?

19 A. Generally, yes, right.

20 Q. But you would not say that precisely where
21 each one of those GPS points is precisely where the Ford
22 Explorer was at that time, right?

23 A. Correct, because then you could also have
24 some error based on how it overlaid onto the Google Map,
25 certainly. Different Google Map dates have some offsets



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1 in the global position of the road width, so that's
2 really where that 3- to 8-foot margin comes into play is
3 the global positioning of these points. But Newton, with
4 the theory of relativity, helps us establish more
5 accuracy based on taking smaller time samples.

6 Q. So how did we get from 3- to 8-feet versus
7 Wes Vandiver's paper which says that the accuracy is plus
8 or minus 5 meters?

9 A. So that is the worst case. That is taking
10 the -- I guess I can call it the 95th percentile
11 accuracy. That is the worst that's ever been reported
12 based on various environmental changes. So when
13 considering GPS coordinates as a whole, you do need to
14 consider how the GPS coordinates are taken. That paper
15 is a more conservative estimate of plus or minus 5 meters
16 of the position as a whole, which is going to be 15 feet
17 or so.

18 Q. Okay. So did Wes Vandiver provide percentile
19 accuracies in his paper?

20 A. Yes. 95th percentile.

21 Q. Okay. So what did he say the 95th percentile
22 is?

23 A. Plus or minus 5 meters.

24 Q. Okay. So what are the -- can you give us the
25 50th percentile? Did he report that?



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1 A. I'd have to double-check the paper.

2 Q. And just to -- are you checking the 2021
3 paper?

4 A. Yes, 2021-010903. And I apologize; I was
5 actually reading the wrong values before. Plus or minus
6 5 meters was for the VBOX Sport performance meter that
7 they used to validate the data. I do need to dig deeper
8 to see what the results were of this generation module,
9 which I am doing now.

10 Q. Well, and I don't want -- I don't mean to
11 make you read the paper. You can do that on a break.

12 Would you agree that this paper is the most
13 thorough discussion of the GPS tracking done by the Gen 3
14 SYNC module that you have cited in your report?

15 A. I think that's fair.

16 Q. Do you think it's fair to rely on this paper
17 as good science as far as the accuracy of the Gen 3 SYNC
18 module?

19 A. Yeah, I think it's fair to rely on any
20 peer-reviewed published literature, but it also needs to
21 be considered as a whole. And considering the specific
22 test conditions that they were under, I'm actually
23 starting to see that this report was more based on the
24 variance of distance between points versus the global
25 position of the points.



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1 So it's not necessarily comparing apples to
2 apples of what I reported as the 3 1/2-to-7 1/2-foot
3 error. So my reference is based on the combination of
4 all the typical GPS accuracy peer-reviewed literature.
5 This one does seem to have a specific goal in mind of
6 providing a value of distance between points.

7 Q. Okay. So when you provided the 3-to-7-foot
8 error rate, that's based on your general knowledge and
9 expertise of the accuracy of GPS systems?

10 A. Along with my other cited literature on GPS
11 accuracy.

12 Q. Okay. So which other cited papers support
13 your 3-to-7-foot error rate conclusion?

14 A. So I referenced three papers. One was SAE
15 2017-01-1437. That was by William Bortles in 2017. I
16 then referenced the Wesley Vandiver paper in 2018 and the
17 Wesley Vandiver paper in 2021.

18 Q. Okay. So I think we agree that the 2021
19 paper is, at least at first glance, not entirely helpful
20 on the question of the GPS error rate, right?

21 A. Well, it's reporting a different value than
22 what we're talking about. It's reporting the error
23 between a distance of two known points.

24 Q. Okay. So in Wes's 2018 paper, what does it
25 say the error rate is for the GPS tracking?



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1 A. I'm going to have to read this paper through.
2 I know when I wrote this report, it was a combination of
3 all of these papers. But if you give me a second, I can
4 certainly read through this paper again.

5 Q. Sure.

6 A. I believe this paper is more so discussing
7 the error of speed.

8 Q. So I think that's correct.

9 So then, I take it what you're really relying
10 on is the Bortles paper, which does say that the GPS unit
11 data error ranges from 3.5 to 7.5 feet. Am I incorrect
12 about that?

13 A. I'm not sure. I'd have to reread the papers
14 to see.

15 Q. If you go to Page 2 of that paper, I think
16 it's about bottom of the first full paragraph.

17 A. Oh, yes, there you go, the coordinate
18 location accuracy.

19 Q. Okay. So do you remember what module was
20 being tested in the Bortles paper?

21 A. I'd have to review it again. So that one, I
22 believe, was a Garmin GPS unit.

23 Q. Okay. Do you see anywhere in that paper
24 where a SYNC Generation 3 module was tested? And I'm
25 talking about the 2017 Bortles paper.



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1 A. Looks like -- looks like it did a
2 Generation 1, 2, and 9, and 10. So there's a -- looks
3 like a large sample of generations.

4 Q. But there's no Generation 3 SYNC module
5 included in the paper, right?

6 A. No. It spanned Generation 3. It's 1 to 10.

7 Q. Okay. So but not -- it didn't include Gen 3?

8 A. I'd agree with that specific.

9 Q. Okay. So did any of the papers that you cite
10 test the GPS accuracy as an actual locational value from
11 a Gen 3 SYNC module?

12 A. There's so many papers out there that I'd
13 have to go back and reread them. I don't have that teed
14 up off the top of my head to know about the specific GPS
15 accuracy. What I can say is that general GPS accuracy is
16 a very heavily-studied science, and it is well understood
17 that the accuracy is going to be heavily dependent on the
18 environmental conditions.

19 And generally, an accuracy of 3 to 8 feet is
20 accepted within the industry of general GPS devices,
21 whether it be a handheld Garmin or a SYNC module. The
22 values reported in these papers may not be apples to
23 apples. They're talking about various different types of
24 variables they're assessing.

25 But in general, overall global GPS accuracy



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1 is very well-known and studied, and that's -- the typical
2 value we accept in the accident reconstruction community
3 is somewhere in that 3-to-8-foot range, which is enough
4 to establish the position of the vehicle on the roadway,
5 but the exact lane position is not something with enough
6 precision to rely on. But again, we go back to that
7 theory of relativity where we're analyzing the small time
8 change between data points.

9 So in this particular case, I can see that
10 the overall accuracy of the GPS data is unreliable as far
11 as its global position. But again, the theory of
12 relativity is what I'm relying on.

13 Q. So just, you know, for the jury, what are
14 you -- when you say the "global position," is that -- in
15 layman's terms, does that mean, like, actually where the
16 car was, or does it mean something different?

17 A. Yeah, on the Earth.

18 Q. Okay.

19 A. The global position of this vehicle on the
20 Earth can only be guaranteed within this range. There
21 are actually federal standards that require GPS systems
22 to adhere to accuracies -- I believe that was established
23 back under Clinton -- was that it required GPS systems of
24 all kinds, any kinds -- whether it's an Apple Watch,
25 iPhone or a SYNC module -- to adhere to these standard



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1 accuracies.

2 And again, that's the global accuracy that
3 anywhere on the planet, it needs to pinpoint you within
4 that range. You do then need to consider open roadway,
5 relative theory between points to help establish trends.

6 So yes, in general, GPS is difficult to help
7 us establish lateral lane position, but we can rely on
8 the trend of those points. And that's what I was trying
9 to express in my report.

10 Q. Okay. So just to sort of sum that up, you're
11 not saying that the GPS track points help you pinpoint
12 precisely where Caylee's vehicle was at every second,
13 right?

14 A. Right, I never did.

15 Q. Okay, perfect, right?

16 What about the bearing data? What is your
17 understanding of the accuracy of the bearing data from
18 the Gen 3 SYNC module?

19 A. I'd have to go back into the paper to see the
20 global accuracy of the bearing data. But it falls back
21 on -- I'm analyzing a trend. And so I don't have an
22 answer teed up, because I didn't rely on it, because that
23 wasn't part of my analysis.

24 What was part of my analysis was theory of
25 relativity, analyzing the trend, the consistency in the



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1 bearing data on the straight segment of road, the
2 consistency of the bearing data in the actual curve of
3 the road and measuring the curve of the road to see the
4 accuracy of that bearing data.

5 So you can say I independently validated the
6 bearing data on the approach around the curve and on the
7 straightaway, and all of those points were consistent
8 with the parallel orientation of the roadway itself. So
9 the bearing data, again, I don't know, necessarily --
10 teed up off the top of my head -- the global accuracy.
11 But when you analyze it on a case-by-case basis, you can
12 determine the validity of the data for this particular
13 case, which was very reliable.

14 Q. So just to break that down, you measured not
15 using the bearing data, but using engineer magic, the
16 curve of Interstate 45 on approach?

17 A. Yes. You can measure the curve.

18 Q. Okay. And so then you can figure out --
19 again, using engineering magic and your expertise -- what
20 the bearing changes are of that curve?

21 A. Yes.

22 Q. And then you compared that, your analysis,
23 against the bearing data from the Gen 3 module?

24 A. Exactly.

25 Q. And it validated, in your opinion, the



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1 accuracy of the bearing data from the Gen 3 SYNC module?

2 A. You got it.

3 Q. Okay. All right. Perfect, perfect. Just
4 want to make sure. Okay.

5 So have you -- you did collect the -- well,
6 strike that.

7 You reviewed the collection of the air bag
8 control module as well, right?

9 A. Of the Ford, right?

10 Q. Of the Ford, yes.

11 A. Yes, mm-hmm.

12 Q. Did you review the ACM download from the
13 Toyota?

14 A. I did.

15 Q. Did either of those vehicles record an event
16 on April 30, 2022?

17 A. Not on that particular date. The Toyota did
18 have two events that were unrelated to the facts of this
19 case, either some prior or subsequent event not
20 consistent with the facts of this case.

21 Q. Okay.

22 A. The Ford had nothing on it.

23 Q. Okay. So what is your understanding of what
24 it takes to trigger the ACM module in the Ford Explorer?

25 A. Typically, it's a 5 mile per hour change in



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1 speed over a 150-millisecond time sample. However, every
2 manufacturer -- that's the federal standard. But many
3 manufacturers will go underneath that standard. So for
4 instance, Toyotas can pick up changes in speed of less
5 than a mile per hour. We'll see a lot of events on
6 Toyotas. So all I can tell you is what the standard is.
7 It's less than 5.

8 Q. Okay. So the lack of an event on the Ford
9 Explorer ACM tells you that there was at least -- strike
10 that.

11 The lack of an event on the Ford Explorer ACM
12 tells you that there was no reduction of speed of 5 miles
13 per hour or less within a 150-millisecond event?

14 A. Or more.

15 Q. Or more, okay.

16 But that's what you're able to derive from
17 that?

18 A. Yes.

19 Q. Okay. So would you typically expect to see
20 an ACM event in a pedestrian motor vehicle accident?

21 A. I have only seen an ACM event for a
22 pedestrian impact, I think, twice in my career.

23 Q. Okay. Describe those situations, if you
24 would.

25 A. One was actually the Mustang that we talked

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1 about earlier going 100 miles per hour. Given the speed
2 difference, that was a -- provided a significant enough
3 change in speed of the Mustang. I don't remember the
4 exact change in speed recorded by the Mustang, whether it
5 was three or four or five or six. But it is rare to get
6 pedestrian impacts recorded on the air bag control
7 modules.

8 Q. Why is that?

9 A. The weight disparity between the vehicle and
10 the pedestrian is such that the vehicle does not change
11 as much speed as the pedestrian does, especially when you
12 have offset collisions, like this particular one where it
13 is just the mass of the pedestrian's head versus the
14 vehicle versus the entire mass of the body versus the
15 vehicle. So the likelihood of having that impact the
16 momentum of the Ford is even less.

17 Q. Okay. Can -- in your experience, are ACM
18 events normally triggered by hitting another object,
19 braking, or a combination of the two? Or is braking too
20 slow to trigger an ACM event?

21 A. Braking is typically too slow. Some of the
22 newer manufacturers are now having event-based triggers
23 like braking. And certainly, braking can be picked up on
24 the sensors during a collision, but typically, they don't
25 trigger an event.



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1 Q. So on the Ford Explorer's ACM, did it pick up
2 a braking event?

3 A. That generation does not pick up braking
4 events. It doesn't trigger based on the braking events.

5 Q. Okay, okay. And you have reviewed the photos
6 from the scene taken by the Texas Department of Safety
7 Troopers, right?

8 A. Yes.

9 Q. Okay. And you've reviewed Caylee's cell
10 phone records?

11 A. Yeah.

12 Q. When I say "records," I mean the download of
13 her personal iPhone, right?

14 A. Mm-hmm, yes.

15 Q. You've not reviewed any other cell phone
16 records of hers, have you?

17 A. There were some exhibits with screenshots of
18 her texts. But the -- I think it's Cellebrite --

19 Q. Yes.

20 A. -- published the report for her cell phone
21 records.

22 Q. But nothing, like, from a carrier, like, from
23 AT&T or something directly like that, right?

24 A. No. I think it was all from Cellebrite.

25 Q. Okay, okay. What else did you review, if you



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1 remember?

2 A. Regarding cell phone?

3 Q. Oh, sorry. Just evidence in this case,
4 which, you know, strike that. That's too broad, and I
5 guess it would be a wild goose chase.

6 You cited the Aperture report dated July 10,
7 2023. Do you recall reviewing that?

8 A. Was that the one that discussed the lack of
9 data on the Ford?

10 Q. I'm not sure, right?

11 Do you know if you included that in the file
12 that you've provided me?

13 A. If it was part of my file, it would be in the
14 file that I provided you.

15 Q. So let's see. Would that be in the expert --
16 or excuse me, in the Materials Received folder?

17 A. Yes, somewhere in there.

18 Q. Okay. Can you tell me where in there?

19 A. Okay. So I think this is the report you're
20 referring to from Aperture, July 10, 2023.

21 Q. But you tell me. Like, just tell me where
22 it's at in this file that you provided me.

23 A. This is located with the Toyota download
24 data. So it would be under Materials Received, Download
25 Data, Toyota Camry, and there's a file titled Toyota



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1 Report.

2 Q. Okay. Very good, very good. Thank you.

3 So would you agree that the quality of your
4 accident reconstruction in this case would have been
5 improved if you were able to get on scene to the crash as
6 soon as possible after the crash occurred?

7 A. No, I disagree with that. The photogrammetry
8 process provided me accuracies within a quarter of an
9 inch, which is going to be within the general accuracies
10 of drone mapping, laser scanning. You know, at the end
11 of the day, the analysis I do typically has a range of
12 even plus or minus a couple feet, because these distances
13 aren't that sensitive. So we're actually using quite
14 high tech equipment to measure things that we don't need
15 that much accuracy on.

16 So no, I don't think the quality would have
17 been better. I think the quality of my reconstruction is
18 consistent with the quality that I would expect if I was
19 out there myself.

20 Q. Okay. Do you ever get called personally to
21 go to crash scenes?

22 A. I do.

23 Q. Recently?

24 A. Yes.

25 Q. Like, how -- how close in time do you



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1 normally go to a crash scene?

2 A. So we call it quick response. We are
3 typically called by the insurance company or the
4 retaining counsel for the insurance company, sometimes
5 quick enough to get to the scene while the vehicles are
6 still on scene before they're towed. It varies; it comes
7 in waves. I would say I get a handful of those a year.

8 Q. Okay. Do you think that's overkill when they
9 do that, since you can do a lot of this with photographs?

10 A. It depends on who is documenting. If nobody
11 takes pictures, then yes, it is helpful for me to be on
12 the scene. If the police are doing a thorough
13 documentation with photographs, it's obviously not
14 necessary. As long as somebody documents
15 photographically, that is sufficient.

16 Q. Okay. What sort of resolution on the
17 photographs do you need to conduct accurate
18 photogrammetry?

19 A. Well, again, it's going to base -- or I'm
20 sorry. It's going to depend on the photographic quality
21 itself. I don't have a standard that needs to be met for
22 the photographs in their quality versus just generally
23 documenting the evidence. And what I can do is then
24 calculate the resolution or the accuracy of that data
25 once I start performing that photogrammetry process.



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1 So in this particular case, like I said, it
2 was -- at worst, plus or minus a quarter of an inch was
3 the worst accuracy I had on the worst point. Everything
4 falls within that "plus or minus quarter of an inch"
5 resolution based on the photos that I've been provided in
6 this particular case.

7 Q. So we talked earlier about photogrammetry
8 basically being this analysis of photos to figure out
9 distances. And I think I understand your testimony
10 earlier that you need -- you need something that you're
11 sure about. You need a distance or -- that you -- in the
12 photos that you are 100 percent or close enough sure
13 about; is that right?

14 A. Yes. You need known 3-dimensional points.

15 Q. Okay. What were the known 3-dimensional
16 points you used in your photogrammetry analysis in this
17 case?

18 A. So CAC performed a drone mapping of the
19 scene. I personally took those photographs and processed
20 them in Pix4D to generate a scaled orthomosaic in
21 3-dimensional point cloud. It is the standard for
22 collecting scene evidence with drones. That is how we
23 document our scenes now is drones.

24 We use the series of photographs collected,
25 and essentially stitches each pixel together from



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1 subsequent photos and establishes 3-dimensional points of
2 those photos. The same process of photogrammetry, but
3 millions of times, using every pixel instead of chosen
4 points.

5 So it's called photo scanning because it uses
6 more than just points. Again, another heavily-validated,
7 peer-reviewed, well-established methodology that we've
8 been using for decades in the industry.

9 And so I use their drone photographs to
10 create my own 3-dimensional diagram of the scene, and was
11 able to use the roadway features that were permanent,
12 like lane lines and roadway cracks and raised pavement
13 markers, barrier wall cracks, anything that I could see
14 between the two and correlate the 3D point for my model
15 and establish that 3D point in the photograph.

16 Q. When was the drone mapping conducted at the
17 scene?

18 A. I believe that was the six months after, and
19 I independently validated that there were no changes to
20 the roadway within those six months based on historical
21 documentation and aerial imagery, flyover imagery, and
22 Google Street View imagery.

23 Q. Now, so how -- do you have to put the
24 photogrammetry of the Toyota that was taken, or those
25 photos that were taken at the scene and at the tow yard,



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1 wherever that was, and put them together with the scene
2 map that you made of the crash scene to figure out where
3 the Toyota was on the road?

4 A. Just to simplify it, no. It wasn't needing
5 to put the Toyota together. It was a photogrammetry
6 analysis of the scene that established the 3D points of
7 the Toyota in the scene.

8 Q. Okay.

9 A. And then, obviously, I can place a 3D model
10 on top of those points from a diagram.

11 Q. Yeah.

12 A. But the position of the Toyota was
13 established from all of the photographs taken on scene.

14 Q. So specifically, what were the fixed points
15 that you used to validate your 3D model?

16 A. That is going to be quite an extensive
17 response. I'm happy to go through it. There are a lot
18 of points. We can go through it one by one. After this
19 question, can we take a lunch break though? Because this
20 will be a long answer.

21 Q. Well, I guess, is the answer to that question
22 recorded somewhere in your report that --

23 A. Yes --

24 Q. -- we can -- rather than have you give an --

25 A. -- there is.



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1 Q. -- extensive answer.

2 So where is that in your report?

3 A. Page 69, Figure 99, through Page 76,
4 Figure 113. And then in addition to that, I have the
5 full PDF report outlining all of the 3-dimensional
6 points, the X, Y, and Z coordinates, of all of those
7 points that were used and are visible in these
8 photographs.

9 Q. So I guess -- and just, you know, glancing
10 through the figures that you just identified, I want to
11 make sure: Are these figures identifying the fixed
12 points that were then used to create the model, or are
13 these figures identifying measurements based on the 3D
14 model?

15 A. Both.

16 Q. Okay. So I guess my question is, Which of
17 these fixed points were unchanged since the accident, the
18 drone picked them up, and then they were used to generate
19 the 3D model?

20 A. So starting with Figure 98, what I used was
21 the road lines, the raised pavement markers; and in this
22 particular case, this roadway was sectioned in squares,
23 and so I was able to use the seams of the roadway, the
24 intersections of those seams as known 3-dimensional
25 points in addition to the rumble strips on the shoulder.



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1 So I had a lot of really good reference
2 points. Normally, we just have road lines like the skip
3 lines and the raised pavement markers. This one, I had
4 the road lines plus all of these cracks and seams in
5 between, which was more than I usually have.

6 Q. So to measure all of this, is that what the
7 drone did? It's, like, the drone measures the distance
8 between road lines and rumble strips, and that's how you
9 can then apply that to these photos and then create the
10 3D model?

11 A. Yeah. Essentially, the drone takes enough
12 photos overhead to establish a 3D model of the scene
13 where every pixel is now a 3-dimensional point. And so I
14 then look at that 3-dimensional point of a crack from the
15 drone scanning and import that into a photogrammetry
16 software enough times on that photo where eventually the
17 camera can be fixed in space, and then I can reverse
18 engineer the unknowns from that photo.

19 Q. Okay, okay. What's the photogrammetry
20 software that you use?

21 A. PhotoModeler.

22 Q. Okay. Is that the one you typically use?

23 A. That's -- there are a couple of others, but
24 yeah, we have PhotoModeler, so that's what we extensively
25 use.



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1 Q. Okay. Is that widely used in your
2 profession?

3 A. Probably the most popular, I would say.

4 Q. Okay. So would you agree that a scene is a
5 little bit like a puzzle?

6 A. I would say that accident reconstruction is
7 like a puzzle, yeah. We're putting puzzle pieces on a
8 puzzle board, and you can say the scene is this puzzle
9 board, and we try to put enough pieces on the puzzle
10 board to try to paint a picture of what happened.

11 Q. Okay. So have you spoken to any of the
12 individuals that inspected the Ford Explorer or the
13 Toyota Camry?

14 A. No. I'm just relying on the photographs and
15 documentation.

16 Q. Okay. Have you relied on any interviews with
17 anyone that you or someone at Focus Forensics took to
18 generate this report?

19 A. No.

20 Q. Okay. So let's go to Page 6 of your report.
21 So on Page 6, you described the immediate approach to the
22 crash, right? And you can use a paper copy if it's
23 faster. Either way is fine.

24 A. What line are you on?

25 Q. So let's go down to the last paragraph on



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1 Page 6.

2 A. Okay.

3 Q. Okay. So you say that -- well, I guess, can
4 we agree that Caylee was northbound on Interstate 45 on
5 April 30, 2022, right?

6 A. Yes.

7 Q. Okay. So you said that Northbound Interstate
8 45, in the area of the incident, was level and flat?

9 A. Yes.

10 Q. Okay. You said the northbound approach was
11 straight for approximately 0.33 miles prior to the
12 incident?

13 A. Yes.

14 Q. Okay. So tell us about the curve on
15 Interstate 45 that Caylee went around before she impacted
16 Nehemias.

17 A. Yeah. It curved to the left by about 13
18 degrees over the course of .17 miles, and then it is in a
19 complete straightaway for that one-third of a mile, or
20 about 1,500 feet.

21 Q. Okay. And you provide a little more accuracy
22 later on in the report. It's about 1,742 feet that it's
23 straight, right?

24 A. No. That's the unobstructed sight line to
25 the northbound travel. It is perfectly straight for



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1 1,500 feet, but as you round the end of the curve, you
2 can start seeing the northbound lane.

3 Q. Okay, okay. Fair enough.

4 So your car can still be turning left, right,
5 but you can -- as a driver, you can look about 1,700 feet
6 forward?

7 A. Yes. The barrier wall was the physical
8 obstruction that we're looking around.

9 Q. Okay. Got it.

10 So you say the speed limit was 75 miles for
11 the area of the collision?

12 A. Yes.

13 Q. And how are you getting that?

14 A. A speed limit sign.

15 Q. Okay. So are you aware of any county rules
16 where the incident occurred that would have lowered the
17 speed limit?

18 A. Not that I've been provided.

19 Q. Okay. So you're just going off, what, the
20 speed limit sign that you saw?

21 A. Yes.

22 Q. Okay. You agree it was clear and sunny on
23 April 30, 2022?

24 A. Yes.

25 Q. How did you reach that conclusion?



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1 A. The weather reports for the nearest airport
2 provided sun and weather data. The body cam videos, the
3 dashcam videos, and photographs provided environmental
4 documentation shortly after the crash.

5 Q. And I saw you provided the azimuth of the
6 sun. So can you agree that the sun was not in
7 Caylee Smith's eyes as she was going straight on
8 Interstate 45 towards Nehemias?

9 A. Correct. It was to the southwest, so it
10 would be behind her and to the left.

11 Q. Okay. So would that mean that, if you're
12 northbound on I-45 towards where the Toyota Camry was
13 stationed, the sun was shining on it? It would -- you
14 would not have been looking at the sun and the Toyota
15 Camry?

16 A. From the pedestrian's perspective?

17 Q. Sorry, yeah. That's a bad question.

18 From the perspective of Caylee Smith
19 approaching the Toyota Camry, she would have seen the
20 Toyota Camry and not seen the sun at the same time?

21 A. Correct.

22 Q. Okay. Any reason to think the sun was not
23 illuminating the Toyota Camry or any of the pedestrians
24 around it?

25 A. No.



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1 Q. Okay. So we agree that weather and glare
2 were not contributing factors to this crash?

3 A. I agree.

4 Q. Okay. So 1,742 feet, that's the unobstructed
5 sight line, right?

6 A. Yes.

7 Q. What is that, about a third of a mile, a
8 little over?

9 A. It's over a third, because a third is
10 1,500 feet.

11 Q. Okay. So you testified, or you included in
12 your report on Page 7, first paragraph, that from the
13 beginning of the unobstructed sight line, if Caylee had
14 been going the speed limit of 75 miles an hour, how long
15 would it have taken her to get to the crash site?

16 A. 16 seconds, approximately.

17 Q. Okay. And I think your report tells us how
18 long, as she comes into that uninhibited sight line, she
19 would have had to get to the crash site if she was going
20 90 miles an hour?

21 A. Yes. 13 seconds, approximately.

22 Q. Okay. So the difference between going the
23 speed limit and going 90 miles an hour as far as time to
24 see the accident or to get to the scene is three seconds?

25 A. Over that distance, yes.



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1 Q. Over that distance. Okay.

2 So can we agree that as Caylee Smith came
3 around the curve, she had at least 13 seconds to spot
4 Nehemias Santos and the Camry?

5 A. So I can't actually tell you what she saw or
6 what she could see. All I can tell you is what was
7 available based on an unpopulated environment. I don't
8 know. Nobody knows what the traffic conditions were. So
9 I don't know how close she was behind a vehicle in front
10 of her; I don't know the status of that vehicle, whether
11 it was a car, a truck, a box truck, a tractor-trailer.
12 All I can say is an unpopulated value would give these
13 values. I can't say what she actually was provided,
14 because I can't replicate the traffic.

15 Q. Okay. Fair enough. Right.

16 Do you have any evidence that indicates to
17 you what the traffic was like? Was it heavy, medium,
18 light?

19 A. I try to avoid subjective terms like that. I
20 know, certainly, the testimony has varying levels of
21 opinion of what the traffic was like. Everyone's opinion
22 is going to be different on what "heavy" is and what
23 "light" is. All I can reference is the photographs, the
24 body cam videos to give a good idea of the backup of
25 traffic. There was traffic, and that's -- I'm going to



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1 stay objective on that. I can't really quantify the
2 traffic.

3 Q. Okay. Are there any objective measurements
4 of traffic flow that you're aware of?

5 A. Annual values, yes, average annual values,
6 but not a specific time frame that we are looking at.

7 Q. So are there any -- in your line of work, are
8 there any descriptions about, like, how many cars are
9 traveling past a certain point in a certain amount of
10 time, like, in an hour or a minute? Are those figures
11 that are normal in your profession?

12 A. Yes. Like I said, the average annual traffic
13 counts. Those are basically just an overall average, an
14 annual average of traffic in that area.

15 Q. Are there any metrics that are more pointed
16 in time, like in an hour or in a day or anything like
17 that?

18 A. Not unless there's, like, a specific traffic
19 study that was requested. I'm not aware of any specific
20 level of data that gives you that level of precision.

21 Q. Okay. Fair enough.

22 A. Can we -- can we stop for lunch?

23 MR. WHITE: Sounds good to me.

24 MR. DUBOFF: Yeah.

25 THE VIDEOGRAPHER: The time is 12:18 p.m. We



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1 are off record.

2 (Break was taken from 12:18 p.m. to

3 12:58 p.m.)

4 THE VIDEOGRAPHER: The time is 12:58 p.m. We

5 are on record.

6 BY MR. WHITE:

7 Q. Okay. This is Jacob White. We just took a
8 little lunch break. So we're coming back on the record.

9 I think we were talking about the line of
10 sight that Caylee had as she was approaching the Toyota
11 Camry. Sound right to you?

12 A. Yes.

13 Q. Okay. Now, you are not offering an opinion
14 about whether Caylee should have seen Nehemias or the
15 Camry as she came around the curve, right?

16 A. I don't think I can as worded. I don't know
17 if she could. What I can say is what fixed environmental
18 objects there were that would have prevented her and the
19 timing of that obstruction. But I can't say anything
20 other than that, because I don't know what traffic was
21 like.

22 Q. Okay. So just to put a point on it, as -- as
23 she came around the curve at a point 1,742 feet south on
24 the road, that's when -- assuming no other obstacles, all
25 the fixed obstacles had been removed between her and the



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1 Toyota Camry?

2 A. You got it.

3 Q. Okay, perfect.

4 Now, are you aware of any evidence -- I think
5 you already answered this, but just let me get this
6 straight. Are you aware of any evidence that Caylee
7 could not have seen the Toyota Camry as she came around
8 the curve other than the fixed median barrier?

9 A. And other than potential traffic, I'm not
10 aware of anything else.

11 Q. Okay. But you don't know about the traffic.
12 Like you said, like, that's just an unknown for you?

13 A. Correct.

14 Q. It's possible that there was traffic between
15 her and the Toyota Camry; you do not know?

16 A. Correct.

17 Q. Okay. So you can agree that Caylee had the
18 capacity to see the Toyota Camry, 1,700 feet -- for
19 1,742 feet away from the Toyota Camry?

20 A. It's possible.

21 Q. Well, it's possible that -- I'm asking, Did
22 she have the capacity, not whether or not she did.

23 A. To me, "capacity" means that there was no
24 traffic, so I can't answer that.

25 Q. Okay. So, well, assuming there was no



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1 traffic, right -- which maybe, maybe not. If there was
2 no traffic, she would have seen the Toyota Camry 1,400 --
3 1,742 feet down the road?

4 A. I agree. If there's no traffic, it was there
5 to be seen, albeit rather small in your field of view,
6 because 1,700 feet is very far away. But yes.

7 Q. Okay, okay. So do you agree that the Toyota
8 Camry was conspicuous to oncoming drivers?

9 A. Depending on traffic.

10 Q. Okay. So if there was no traffic, was the
11 Toyota Camry conspicuous to oncoming -- or to
12 Caylee Smith?

13 A. Yes.

14 Q. Okay. Why do you say that it was
15 conspicuous?

16 A. Because it was there to be seen.

17 Q. Okay. So is there any factors about the
18 Toyota Camry that made it more conspicuous than any other
19 objects on the road?

20 A. I don't know if I understand that question.

21 Q. Okay. So you said that it was conspicuous
22 because it was there to be seen, right?

23 A. Right.

24 Q. So did you study the conspicuity of the
25 Toyota Camry?



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1 A. Conspicuity is really only a factor for
2 nighttime detection. That's not really a variable we
3 analyze in the daytime analysis.

4 Q. Okay. So how do you analyze in a daytime
5 analysis whether or not an object in the roadway is
6 easily seen by oncoming traffic or hard to see?

7 A. It depends on the factors of the case. So
8 visibility is not the critical variable that we're
9 analyzing here. It is identification of an imminent
10 hazard. So visibility has no bearing on the analysis of
11 avoidability. It's when did the hazard become imminent?

12 Q. Okay. And your testimony, I believe, earlier
13 was that it's your expert opinion that the Toyota Camry
14 by itself was never an imminent hazard, right?

15 A. Correct. It was a potential hazard, is what
16 the literature references it as, which does require some
17 form of input but not an emergency input.

18 Q. So where in your report did you differentiate
19 between potential hazards and imminent hazards?

20 A. Well, these aren't necessarily things I was
21 planning on bringing forth, but you've certainly been
22 asking a lot of questions about it, which I have the
23 expertise to answer. So I've been answering your
24 questions.

25 Q. Sure, sure. Would you -- if you had the

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1 opportunity, would you like to amend your report to
2 include those conclusions?

3 A. I guess it depends on the issues at hand. If
4 the opposing expert is going to opine differently than
5 that, then yes, I will need to amend my report to rebut
6 his or her opinions. At this point, I didn't know if
7 this was going to even be an issue or not.

8 Q. Okay. So do you agree, based on your view of
9 the evidence, that the Toyota Camry was black?

10 A. Yes.

11 Q. Okay. And the roadway was, I'm going to say,
12 light-colored?

13 A. Sure.

14 Q. Is that fair?

15 A. Sure.

16 Q. Okay. The median was light-colored?

17 A. Yeah.

18 Q. Okay. The median barrier was light-colored?

19 A. Right.

20 Q. And then on the right-hand side of the road
21 was a grassy ditch, right?

22 A. Right.

23 Q. Not dark-colored, right?

24 A. Right.

25 Q. Okay. So can we agree that, on approach from



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1 Caylee Smith's perspective, the trunk of the Toyota Camry
2 was open?

3 A. It was.

4 Q. Okay. And now, I think we all agree that it
5 was, but, like, technically, we don't know, right?

6 A. I believe there was body fluid inside the
7 trunk lid --

8 Q. Okay.

9 A. -- which would indicate it was open at the
10 time.

11 Q. Fair enough, fair enough.

12 Do you know if the emergency flashers were
13 on?

14 A. I know they were on in the body camera
15 videos, so I think it's safe to say that they were on at
16 the time of the impact.

17 Q. Okay. Do you know how many pedestrians were
18 around the Toyota Camry as Caylee Smith approached?

19 A. It's either two to five depending on who you
20 believe.

21 Q. Okay. So if it was just two, it was
22 Nehemias Santos and Evelyn Moreno, right?

23 A. Yes.

24 Q. And if you believe Evelyn Moreno and
25 Erick Santos, it was all five of the passengers in the



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1 car?

2 A. Correct.

3 Q. Okay. So do you agree that a reasonably
4 prudent driver would have vacated the leftmost lane or
5 slowed down after they saw the Toyota Camry?

6 A. Not based on the literature. In part, I do
7 want to say a reasonable driver does slow down. We know
8 that Caylee slowed down. She slowed down and moved over
9 to her right. That is what the literature shows the
10 average driver does.

11 Q. So does the literature tell us when someone
12 would slow down and move to the right if they saw a
13 hazard in their lane?

14 A. They indicate 1 to 3 miles per hour of speed
15 loss from a reduction of accelerator pedal application,
16 which, on a timeline, is actually after Caylee started
17 reducing her speed. So Caylee started reducing her speed
18 first, before, or quicker than the average.

19 Q. So does the -- does the literature indicate
20 how far away from the hazard or how soon after the hazard
21 gets identified that someone would reduce their speed and
22 move to the right?

23 A. I'd have to double-check that in the form of
24 distance. But again, we can figure that out from speed
25 loss and the magnitude of the speed loss.



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1 Q. Okay. So do you have an opinion of, as far
2 as the literature goes, when most drivers, how far away
3 they are from a hazard when they, you know, get over to
4 the right and start slowing down?

5 A. Well, it's going to depend on their original
6 speed. So I don't think there's a standard I can answer
7 that with, because it's going to be based on the original
8 speed of travel. What I can say on a time and speed
9 standpoint, 1 to 3 miles an hour has been the speed
10 reduction; Caylee reduced her speed by at least four. So
11 she started reducing her speed sooner, and she reduced
12 her speed more than the average driver.

13 Q. So you say, "She started reducing her speed
14 sooner." What do you mean by that?

15 A. Well, she indicated that she just let go of
16 the gas, and that is the typical response that we see in
17 the literature is releasing the gas. So the deceleration
18 rate's going to be very similar, which is releasing the
19 gas pedal with no brake application.

20 Q. Can you tell from the infotainment module
21 whether she took her foot off the gas before she hit
22 Nehemias or as she's in the process of hitting Nehemias?

23 A. 100 percent before.

24 Q. Okay. How far before?

25 A. Let me get that distance for you.



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1 Approximately 250 feet away.

2 Q. Okay. So what -- what data are you looking
3 at to conclude that she was 250 feet away from hitting
4 Nehemias Santos when she began to slow down?

5 A. This is looking at the track point data,
6 which gives us data every one second. And in my
7 engineering calculations, I calculate the distance
8 traveled between those points based on the speed values
9 reported.

10 Q. So looking at the track log, at what
11 second -- now, you say this in your report, so this isn't
12 a trick question. But at what second do you believe the
13 collision occurred?

14 A. The time stamp that I have here is sometime
15 between 2:48:51 and 2:48:52.

16 Q. Okay. So when you're calculating the
17 reduction in speed, are you looking at her speed -- well,
18 tell me at what point you see her speed begin to decrease
19 on the track log seconds.

20 A. 250 feet away.

21 Q. Okay. What second is that in the track log?

22 A. 2:48:50.

23 Q. Okay. So at -- you're saying at 2:48:50 is
24 when she begins to start slowing down?

25 A. Yes.



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1 Q. What is her speed at 2:48:50?

2 A. 90 miles per hour.

3 Q. Okay. And that's kind of a rounding, right?

4 Or is it precisely 90 miles an hour?

5 A. It's pretty spot-on to 90, yes.

6 Q. Okay. All right, yeah, it's 89.97.

7 So again, the next second, what is her speed,

8 2:48:51?

9 A. 87.

10 Q. Okay, 87.

11 And so, then, what is her speed at the next

12 second, 2:48:52?

13 A. 82.

14 Q. Well --

15 A. 83.

16 Q. 83, okay.

17 So between 2:51 and 2:52 -- strike that.

18 Between 2:48:51 and 2:48:52, do we know which

19 of those seconds the collision occurred at? Or I know

20 your report says it's one of those two or between.

21 A. Somewhere between.

22 Q. Okay. So you say that her speed began to

23 reduce two seconds before she collided with

24 Nehemias Santos, right?

25 A. One and a half, yeah, about one and a half.



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1 It could be up to two.

2 Q. Okay. So one and a half to two seconds
3 before she collides is when she begins reducing her
4 speed?

5 A. Right.

6 Q. Okay. Can you tell from the evidence that
7 you've got if the speed reduction is the result of taking
8 a foot off the gas or tapping the brake?

9 A. Well, the subtleties between when you say
10 "tapping," it's consistent with a speed loss of letting
11 go of the gas. Now, if she touched the brake, could be
12 consistent with that too.

13 Q. Okay.

14 A. But it's not consistent with hard brake
15 application.

16 Q. Okay. And you've reviewed the police report,
17 right?

18 A. Yes.

19 Q. And you agree that the police report says
20 there are no brake marks created by the Ford Explorer?

21 A. I think that's what it says, yes.

22 Q. Okay. Did you see any brake marks created by
23 the Ford Explorer?

24 A. No.

25 Q. Okay. So to the best of your knowledge,



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App. 000203

1 right, there's no affirmative evidence that Caylee
2 applied the brakes in the two to three seconds before she
3 hit Nehemias Santos, right?

4 A. Well, you don't necessarily have to have tire
5 marks to apply the brakes, especially with modern ABS.
6 We actually rarely see tire marks.

7 Q. Well, I'm not asking if it's possible she
8 applied the brakes. I'm asking, Do you see any evidence
9 that affirmatively shows that she applied the brakes in
10 the two to three seconds before collision?

11 A. Not one way or the other. She certainly
12 could have; she may not have.

13 Q. You just can't tell?

14 A. No. But it is consistent with a speed loss
15 rather greater than the average speed loss of the average
16 driver faced with this situation.

17 Q. Okay. So you think that she maybe did hit
18 her brakes?

19 A. No, I never said that. I said she reduced
20 her speed greater than the average driver does in this
21 particular situation.

22 Q. So just to put a pin on it, you're saying
23 that the speed change from 90 miles an hour to somewhere
24 between 87 and 86 miles an hour, two seconds to one and a
25 half seconds before hitting a pedestrian, that's normal



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1 for a reasonable driver?

2 MR. DUBOFF: Objection to the form.

3 A. The speed loss is what the typical driver
4 does to a roadside vehicle and pedestrian.

5 Q. Okay. When you say "a roadside pedestrian
6 and vehicle," are you talking about a vehicle stopped in
7 the lane?

8 A. I am.

9 Q. Okay. Have you reviewed literature that
10 discusses driver reactions to vehicles stopped within the
11 lane?

12 A. It's typically either entirely within the
13 lane or entirely out of the lane. I'm not aware of any
14 studies that show 2 feet into the lane. So the best I
15 can do is look at this as a vehicle parked on the
16 shoulder and look at what drivers typically respond to to
17 a vehicle parked on the shoulder. Since this was mostly
18 on the shoulder, it's the closest we have to compare to.

19 Q. So you didn't compare this situation to the
20 literature examining motor vehicle drivers reacting to a
21 vehicle parked entirely in the lane?

22 A. No. This is not anywhere near that type of
23 scenario. That is a totally different visual stimulus,
24 totally different set of equations that factor in the
25 capability of drivers to appreciate relative closing



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1 speed. The presence of the vehicle mostly on the
2 shoulder gives the cue that this vehicle is slow or
3 stopped, particularly with the pedestrians standing
4 outside the vehicle and the trunk lid open. If the
5 vehicle was entirely in the lane, that would be a whole
6 different ball game on a driver's ability to appreciate
7 that it's traveling slow versus at normal highway speeds.

8 Q. Okay. So how do drivers react when they see
9 a vehicle stopped entirely in the lane?

10 A. So just to be clear, that's not what we have.

11 Q. That's fine, that's fine.

12 A. But based on that, drivers' abilities to
13 avoid a vehicle on a highway -- a straight, flat level
14 segment of highway -- stopped in their travel lane is
15 virtually impossible to avoid. The rate of closure,
16 anything greater than 45, 50 miles per hour of a closing
17 speed becomes rather difficult, if not impossible, to
18 avoid.

19 Because by the time the human eye can
20 appreciate the relative closing speed between them and
21 the vehicle ahead of them, it's too late to fix that
22 relative speed in the form of braking or steering. So a
23 closing speed of 90 or even 70 or 75 would be unavoidable
24 entirely if the Toyota was stopped in the travel lane.

25 Q. Okay. So I mean, facts matter, right? I



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App. 000206

1 mean, there could be things going on around the car; say
2 it was a police car or an emergency vehicle with its
3 lights on, right?

4 A. Well, now you're talking a completely
5 different visual stimulus, yes.

6 Q. Sure, sure. So it depends on what's
7 happening at the scene to determine the visual stimulus
8 that oncoming drivers are reacting to?

9 A. Right, and that's why I didn't model this as
10 a stock vehicle in the travel lane, because that's not
11 the visual stimulus we have here.

12 Q. Okay. So why is it just one option? Like,
13 why model it as a car parked entirely on the shoulder or
14 a car parked entirely in the lane? Like, why not model
15 it as a car parked 2 feet into the lane and however many
16 feet on the shoulder?

17 A. As far as I'm aware of, there are no human
18 factor studies that divide the two. It's studies that
19 show what drivers do when a vehicle is parked on the
20 shoulder and studies that show what drivers do when a
21 vehicle is stopped in an active travel lane. In this
22 particular case, there was enough context to visually
23 indicate that this vehicle was stopped on the shoulder.
24 There was no question about that.

25 Q. Okay.



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1 A. So the modeling of this visual stimulus as a
2 vehicle parked on the shoulder is entirely consistent
3 with that literature. There is no question of "valid."

4 Q. So in your view, the literature leads you to
5 believe that an oncoming driver would have seen the
6 Toyota and understood that it was stopped?

7 A. Yes.

8 Q. Okay. There wouldn't have been this
9 phenomenon of, "Is it stopped or isn't it?" in closing
10 too fast?

11 A. No.

12 Q. Okay. So can you agree that if a driver saw
13 a vehicle partially in the lane of travel on an
14 interstate highway that a reasonable driver would pay
15 attention to that vehicle and evaluate its risk?

16 A. I can't talk about what a reasonable driver
17 would do. Again, all I can tell you is what the studies
18 show the average driver does and let the jury decide
19 what's reasonable. And what I can tell you is the
20 studies show that the average driver simply shifts over
21 in their lane.

22 Q. Okay. And they do that why, according to the
23 studies?

24 A. I don't know if the studies particularly say
25 why. But obviously, I think the assumption is to provide



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1 additional space.

2 Q. Okay. So did you -- I think we talked about
3 this earlier. Did you calculate whether Caylee had
4 sufficient time to brake to avoid the Toyota Camry?

5 A. So that is a calculation we can't do, because
6 we don't know when the stimulus started as far as the
7 pedestrian bending over into her travel lane. She had
8 already responded to the car.

9 Q. So let me just ask a very specific question:
10 You believe she did have time to brake to avoid hitting
11 the Toyota, right?

12 MR. DUBOFF: Objection to the form.

13 A. I don't agree that braking would be a good
14 avoidance option, because now you're creating hazards for
15 traffic behind you. The Solomon curves indicate that if
16 you go slow on a highway, your crash risk exponentially
17 increases. So you certainly want to reserve braking for
18 absolutely necessary circumstances.

19 Q. Fair enough.

20 A. So that is not a good avoidance option.

21 Q. Fair enough.

22 I'm asking, Was it an avoidance option that
23 she could have utilized, given the amount of time that
24 she had approaching the Toyota Camry?

25 MR. DUBOFF: Objection to the form.



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1 A. It is not an appropriate response. It would
2 have likely resulted in possibly some other conflicts.
3 And the average driver would not apply the brakes to
4 something that is not an imminent hazard. Again, we
5 don't lock up our brakes and then say, "Oops, I guess I
6 didn't need to lock up my brakes." We reserve it for
7 absolutely necessary hazards. Locking up the brakes for
8 a car 2 feet into your travel lane is not a viable
9 option.

10 MR. WHITE: So I'm going to object to the
11 nonresponsive form of the answer.

12 Q. My question is whether or not she had time to
13 apply the brakes as she approached the Toyota Camry.

14 MR. DUBOFF: Objection to the form.

15 A. So the Toyota Camry was never an imminent
16 hazard; it was a potential hazard. So that calculation
17 cannot be done, because perception response times and
18 braking distances apply to imminent hazards. So you're
19 asking me to completely disregard the instructions of
20 human factors, which is only applied in the literature to
21 imminent hazards. I would be violating the first rule of
22 human factors analyses in applying an imminent emergency
23 response to a potential hazard. That is not appropriate.

24 Q. So you won't tell me whether or not she had
25 time to apply the brakes as she approached the Toyota

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App. 000210

1 Camry?

2 MR. DUBOFF: Objection to the form.

3 A. What I'm telling you is nothing indicated to
4 her that she needed to slam on the brakes.

5 Q. I didn't ask about slamming on the brakes. I
6 asked, Are you refusing to tell me whether or not she
7 could have applied her brakes as she approached the
8 Toyota Camry?

9 A. Well, everybody is capable of applying
10 brakes. But the question is, Was there any visual
11 stimulus that would require a driver to do so? So the
12 question you're asking is irrelevant of the facts of the
13 case. Can you apply brakes? Yeah, you can apply brakes
14 anytime you want.

15 Q. Could she have -- did she have time to apply
16 her brakes to reduce her speed as she approached the
17 Toyota Camry?

18 A. Again, the time has to be relative to the
19 imminent hazard. You're asking me to measure something
20 that doesn't exist.

21 Q. Okay. I'm asking you, After she saw the
22 Toyota Camry, did she have time to apply the brakes to
23 reduce her speed?

24 A. I don't know when she saw the Camry.

25 Q. Okay. You saw that she -- you've read her



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App. 000211

1 deposition, right?

2 A. Yes.

3 Q. What do you understand her testimony is about
4 when she saw the Toyota Camry?

5 A. I don't know.

6 Q. So you don't remember?

7 A. She can't give a distance, and that's what I
8 would need is a distance.

9 Q. So tell me if what I'm about to tell you is
10 inconsistent with what you understand. You agree that
11 she testified that she sent a text message to Gracie
12 saying the tattoo shop didn't do walk-ins?

13 A. Yes.

14 Q. And your opinion is she sent that text
15 message eight to nine seconds before the collision
16 occurred?

17 A. Yes.

18 Q. And you agree that her testimony is that she
19 then looked up, saw the Toyota Camry in the road?

20 A. Yes.

21 Q. Okay. And as a result, her testimony is that
22 she adjusted rightward while remaining in the leftmost
23 lane?

24 A. Right. She responded to the Toyota.

25 Q. Okay. So my question is, when -- sorry. You



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App. 000212

1 understand that her testimony is, then, that she looked
2 at her GPS as she was approaching the Camry?

3 A. Yes. She understood that her corrective
4 action was complete; there was no more risk or no more --
5 I don't want to say "risk." There was no more required
6 response, because she implemented her response to the
7 potential hazard. She looked at her GPS, then another
8 hazard unfolded in front of her.

9 Q. So in the eight to nine seconds after she
10 sent the text message to Gracie, was that enough time for
11 Caylee to apply her brakes?

12 MR. DUBOFF: Objection to the form.

13 A. Again, you can certainly apply your brakes
14 anytime you want. The question is, What is going to tell
15 you to do so? And the average driver would not be
16 provoked to apply the brakes at that point, again,
17 because the literature says drivers don't respond until
18 the threat is imminent and certain.

19 And applying the brakes at that point would
20 increase the risk of additional conflicts, because now
21 you're creating a speed differential on a highway, the
22 exact same thing the Toyota created, was this drastic
23 speed difference between travel speed, traffic, and their
24 parked position on the shoulder.

25 Q. Do you know the relative speed of Caylee and



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App. 000213

1 any other vehicles that were traveling on the roadway
2 that day, other than the Toyota Camry?

3 A. The testimony said just typical speed of
4 travel.

5 Q. Okay. What was the speed limit?

6 A. 75.

7 Q. Okay. And Caylee was going how fast on
8 approach?

9 A. 90.

10 Q. Okay. So do you know what an advanced
11 warning area is?

12 A. You need to be more specific. That's a
13 pretty broad term.

14 Q. Do you know how the Federal Department of
15 Transportation defines an advanced warning area?

16 A. Are we talking maintenance of traffic
17 signage?

18 Q. Yes.

19 A. As far as construction zones?

20 Q. Construction zones or any lane closure.

21 A. Yes.

22 Q. Okay. What is an advanced warning area?

23 A. It's signage that indicates that there is
24 some -- something ahead that's going to either require
25 additional attention or your response in the form of a



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App. 000214

1 lane change or speed reduction if there's a speed
2 reduction sign.

3 Q. So I know we talked earlier about how traffic
4 maintenance kind of starts going out of your area of
5 expertise, correct?

6 A. Correct.

7 Q. But do you know what the Department of
8 Transportation recommends as the minimum distance at
9 which a driver should be warned of an upcoming hazard on
10 an interstate highway?

11 A. I know I have read it, but that involves
12 significant safety factors. And as far as work zones go,
13 that has no relevancy to this case, so I haven't made
14 that comparison because it has nothing to do with this
15 case.

16 Q. Well, undoubtedly, there's a bunch of detail,
17 you know, on additional warnings. But do you know the
18 minimum warning that the Department of Transportation
19 says must be given to a driver if there's a hazard on the
20 road ahead?

21 A. Define "hazard."

22 Q. Some sort of obstruction like a lane closure
23 or repairs being made.

24 A. Yeah, that is a whole different ball game. I
25 don't know the definite number.



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App. 000215

1 Q. Okay. If it's -- if I told you it's at least
2 1,000 feet, does that sound wrong to you?

3 A. No. I know it's in the order of fractions of
4 a mile, maybe, if not more, up to a mile. But again,
5 we're talking apples and oranges here. This has no
6 bearing on this particular case.

7 Q. So do you think 1,000 feet is sufficient for
8 a driver to become aware of an upcoming lane closure?

9 A. If you provide enough clear information, yes.
10 The signs are designed to be very clear in their
11 instruction of what is occurring or what to do, typically
12 in the form of arrow boards telling you to get over.

13 Q. So 1,000 feet of warning can be sufficient to
14 warn a driver of an upcoming hazard, right?

15 A. If you give them enough information. Looking
16 at a Toyota obstructing 2 feet of a travel lane
17 1,000 feet away is going to be so small in your field of
18 view that you're not going to appreciate how much of that
19 travel lane, if at all, they're obstructing.

20 Arrow boards are designed where you pass
21 arrow boards thousands of feet before the lane closure,
22 so you're physically passing the information. The
23 information is bright, it is big, and it is clear. It is
24 giving you an arrow telling you which direction to go and
25 which direction to change. Signage tells you things.

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App. 000216

1 The small field of view of a vehicle parked
2 on a shoulder with maybe a little bit into the travel
3 lane is not clear at 1,000 feet away.

4 Q. Okay. So now, are pedestrians clear at
5 1,000 feet away on an interstate highway?

6 A. No.

7 Q. You can't see pedestrians at 1,000 feet away?

8 A. They're very small in the field of view.

9 Q. Are emergency lights visible at 1,000 feet
10 away on an interstate highway?

11 A. Yes, lights are designed to be visible from
12 great distances away. They're big, and they typically
13 convey a message, an understandable message.

14 Q. Well, what is the understandable message
15 conveyed by an emergency light on a normal passenger car?

16 A. Oh, you're talking about the four-way
17 hazards?

18 Q. Well, yeah, I'm not an expert. I mean the
19 lights that come on when you press the red triangle on
20 your dashboard.

21 A. It can mean many different things. A lot of
22 drivers accidentally leave those hazard lights on while
23 they drive. But I think in general, the general
24 understanding is that the vehicle is stopped or disabled.

25 Q. Okay. Well, would you agree or disagree with



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App. 000217

1 me when I say that they're designed to convey that
2 there's an emergency?

3 A. No.

4 Q. Okay. You agree that emergency lights
5 convey, "Hey, there's an emergency"?

6 A. What kind of emergency lights?

7 Q. A passenger -- a car --

8 A. No, I don't think --

9 Q. -- emergency lights.

10 A. -- they respond -- I don't think they're
11 saying "emergency." They're hazard lights; they're
12 indicating a potential hazard.

13 Q. Okay. Now, like you said, you've reviewed
14 the infotainment module and cell phone records, correct?

15 A. Yes, mm-mm.

16 Q. So -- and you concluded that Caylee sent her
17 last text message to Gracie eight to nine seconds prior
18 to the collision, right, on Page 13 of your report?

19 A. Yes.

20 Q. So you also concluded that at that time she
21 sent that text message, how far away was she from impact?

22 A. Over 1,000 feet.

23 Q. You say specifically here, and can you just
24 say it for the record? It's on Page 13 of your report.

25 A. 1,022 to 1,146 feet away.



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App. 000218

1 Q. And that depends on whether or not she sent
2 the text message at eight seconds or nine seconds
3 before --

4 A. Exactly.

5 Q. -- right?

6 And we just don't know, right?

7 A. Somewhere in that range.

8 Q. Somewhere in that range, right.

9 So -- and I take it you're getting -- you did
10 what I did, which is you lined up the time stamps on her
11 text messages with the time stamps on the track log,
12 right?

13 A. Correct.

14 Q. And the hours are different, right?

15 A. There is a difference on when it's reporting
16 Central Daylight Time versus Central Standard Time, so
17 there's a factor of daylight savings time.

18 Q. Okay. But you concluded that the hour
19 differential was -- is irrelevant; that, in fact, those
20 time stamps should line up?

21 A. Well, they do. It's clearly indicating
22 Central Daylight versus Central Standard. Those are
23 always an hour apart.

24 Q. Okay.

25 A. So it's just they report it in different



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App. 000219

1 units, essentially.

2 Q. Okay. So you don't have a problem with
3 lining up the track logs from the infotainment center
4 with the time stamps from the cell phone records?

5 A. Correct.

6 Q. Okay. So if she had 1,742 feet of
7 unobstructed sight line, how many of those feet did she
8 go before she sent the text message?

9 A. It would be 1,700 minus the 1,022 to 1,146.

10 Q. So rather than us whip out our calculators,
11 say it's approximately 700 feet?

12 A. Yeah, sure.

13 Q. Okay. So just to get a clear record, the
14 difference between when she had an uninhibited sight line
15 to the Toyota Camry and when she sent the text message,
16 she had driven about 700 feet?

17 A. True. But again, the relative size of the
18 Camry at 700 -- 1,700 feet away is rather small.

19 Q. Okay. But you agree with that math
20 calculation that she used up about 700 feet of her
21 uninhibited sight line before she sent the text message?

22 A. In the most simplest terms, yes, if you want
23 to take out the factor of visual size of the hazard.
24 It's much more complex than just a simple subtraction
25 calculation like we just did.



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App. 000220

1 Q. Are you aware that Caylee Smith says,
2 sometimes, that Nehemias Santos suddenly appeared in
3 front of her vehicle?

4 A. I know she used a couple different ways of
5 expressing that he suddenly breached her travel.

6 Q. Okay. Do you agree that, to a distracted
7 driver, an obstacle that has been in the roadway for a --
8 for a long period of time may seem to have suddenly
9 appeared once the driver notices the obstacle?

10 A. Not in this case. So Mr. Nehemias was within
11 the envelope of the Toyota for the time leading up to
12 impact. Caylee had responded to that already. He then
13 became a secondary hazard by breaching her travel path
14 and sticking his head outside of the envelope of the
15 Toyota.

16 Q. Okay.

17 A. So the timing of that is well within the
18 eight seconds, so your question has no application to
19 this case.

20 Q. So I just want an answer to my question. My
21 question is, Do you agree that, to a distracted driver,
22 an obstacle that's been in the roadway may seem to have
23 suddenly appeared when the driver finally notices the
24 obstacle?

25 A. I can only answer to the facts of this case,



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App. 000221

1 and that question does not apply to the facts of this
2 case, so I can't answer that generally. I'm here to
3 apply the science to this particular case, and that
4 doesn't apply.

5 Q. So you're not an expert on distracted
6 driving?

7 A. What I'm saying is the way you worded that
8 question doesn't apply to the facts of this case, so
9 answering that question would be providing something
10 outside of the facts of this case.

11 Q. Okay. So you could answer that question, you
12 just don't think that's what happened in this case?

13 A. It's not relevant to the facts of this case.

14 Q. Okay. So -- and we'll get into why you think
15 you know what happened.

16 But I'm asking, Do you think that a
17 distracted driver could think that an obstacle suddenly
18 appeared, even though the obstacle had been in their lane
19 of traffic?

20 MR. DUBOFF: Objection to the form; calls for
21 speculation.

22 A. The best answer I can give you is, It
23 depends. I can't give you a blanket answer like that
24 because it doesn't apply to every scenario. I have to --
25 I have to analyze each individual scenario individually,



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App. 000222

1 and that doesn't apply to every scenario. So my answer
2 is, It depends. It's not a yes-or-no answer.

3 Q. Okay. So it's possible that someone that's
4 distracted could think than an obstacle suddenly
5 appeared, even though it hadn't?

6 A. It depends.

7 Q. So is that a yes, it's possible?

8 A. Sure, it's possible, based on the facts of
9 the case, sure.

10 Q. Okay. Is there any electronic data that
11 you've reviewed other than Caylee's testimony that proves
12 what she was doing in the driver's seat of the Ford
13 Explorer after she sent the text message to Gracie?

14 A. I think I understand your question, which is,
15 Is there any physical or digital evidence that tells us
16 what she did after? Well, we know she swerved, based on
17 the physical evidence, so we know she responded. So
18 yeah, my answer is yes, the physical evidence indicates
19 that she responded in that time.

20 Q. Okay. So other than her speed and her
21 swerving, right, do we know what else she was doing in
22 the cab of the Ford Explorer after she sent the text
23 message?

24 A. Other than responding to the hazard.

25 Q. Okay. So do you have -- do you see any



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App. 000223

1 physical evidence or electronic data that indicates that
2 she checked her GPS after she sent the text message?

3 A. No. I don't think there's electronic data to
4 tell us where her eyes were looking.

5 Q. Okay. Is there any electronic data or
6 physical evidence you've reviewed that tells us whether
7 or not she was looking at her phone or dictating or
8 writing a text message after she sent a text message to
9 Gracie?

10 A. No. What I can say is she did respond in
11 those eight seconds. So at some point, she did identify
12 the hazard.

13 Q. Okay. All right. I just -- you know, I just
14 want to make sure I got the universe of your opinions
15 right, that you're not going to go to trial and say,
16 "Hey, I know she was actually, you know, looking at her
17 GPS as she approached the -- or after she sent the text
18 message." You don't know that, right?

19 A. She says she did.

20 Q. She says she did.

21 But other than that, is there any other
22 corroborating evidence that you've reviewed?

23 A. No.

24 Q. Okay. So is there -- all right. Let's go to
25 Page 4. So on Page 4, your second opinion is that,



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App. 000224

1 quote, While a flat tire reduces the handling
2 characteristics of a vehicle, it does not eliminate the
3 ability to steer the vehicle off the roadway, as
4 evidenced by Ms. Evelyn Moreno's ability to come to a
5 controlled final rest on the left side of the roadway.
6 Steering to the right was equally possible."

7 I got that right?

8 A. Yes, sir.

9 Q. Very good.

10 So did you see the groove created in the
11 asphalt, presumably by the rim of the Toyota touching the
12 asphalt?

13 A. Yeah. I really saw it more as a flat tire
14 mark. When a tire goes flat, the center of the tire
15 folds in, creating two outboard contact points of the
16 rubber, and which rubs and leaves that black outboard
17 marking on each side of the tire.

18 That tire mark, at least from where the
19 officers photographed it, started about centered, just to
20 the left of center of the left travel lane, which means
21 that at that point, which may or may not be the beginning
22 of the flat tire, the Toyota was hugging the right side
23 of the lane.

24 Q. Okay. So but you don't know if that's
25 because previously she'd been in the middle lane and she



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App. 000225

1 was going into the left lane --

2 A. Exactly.

3 Q. -- or -- so you don't know, correct?

4 A. I don't know. But if she was in the left
5 lane, she was hugging the right side of the lane when the
6 flat tire happened. Or if you believe the other
7 testimony that she indeed was in the middle lane and that
8 is just simply her changing lanes to the shoulder.

9 Q. Okay. So -- but it's just hard to tell from
10 that groove or that tire mark, right?

11 A. I can't tell definitively. But what I can
12 tell the jury is that at the start of that tire mark that
13 was photographed, she is on the right side of her lane.
14 So I'll let the jury decide what they want to take of
15 that, whether that is just simply her driving on the
16 right side of the left lane when the flat happens, or if
17 she actually did indeed make a lane change from the
18 center lane to the left lane to the left median.

19 Q. Okay. Do you have any idea whether or not
20 the tire mark was created the moment that the flat
21 occurred, or is it possible that the flat began earlier
22 and then progressed to a point where it began leaving the
23 mark?

24 A. I would say it's probably more likely that it
25 progressed -- or it started earlier than what was



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App. 000226

1 photographed.

2 Q. Why do you say that?

3 A. Well, the cops didn't necessarily show the
4 start of the tire mark very well. I still think there's
5 a little bit more tire mark to be seen. So it's
6 sometimes very hard to identify. And I'm not blaming
7 them; it's sometimes hard to identify the beginning of a
8 tire mark. And so I don't know if it would be
9 instantaneous. I think it would likely take some time to
10 generate the heat from the rubber rubbing incorrectly
11 against the asphalt to start leaving that mark.

12 Q. Okay. So do you -- so what you've described,
13 that the rubber deforms around the rim as -- you know, as
14 a flat tire progresses; is that right?

15 A. Yeah. The rubber is fixed at each outboard
16 side by the rim, by the rim flange. So when you get rid
17 of the pressure, there's nothing supporting the center of
18 the tire, so that's what folds first. And then the
19 outside rim flanges keep the rubber rigid more.

20 Q. What happens as that pressure deflates and
21 the rim begins touching the rubber?

22 A. The rim will either roll on the rubber and
23 start eating into the rubber, or the rubber can fold out
24 underneath one of the rim flanges, and the rim can start
25 digging into the asphalt.



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App. 000227

1 Q. Could you tell from what you reviewed here
2 whether or not the rim ate into the rubber but the
3 rubber -- but didn't puncture it, or if it did puncture
4 it and began touching the asphalt?

5 A. I don't know if I would agree that it
6 punctured it. Sometimes it rolls or folds out underneath
7 the rim flange. I'd have to go back and look at the
8 pictures to answer that question.

9 Q. Okay, okay. So what -- what is your
10 expertise of how a vehicle handles when a flat tire
11 occurs?

12 A. Depending on the type of failure will define
13 the magnitude of the dynamics. Generally, it's going to
14 create resistance, and it's going to pull, so the left
15 side tire will pull to the left a little bit. The
16 magnitude of that pull will depend on the type of
17 failure.

18 A tread separation will give the greatest
19 resistance. That is when the tread of the tire separates
20 from the carcass of the tire and it's flapping in the
21 wheel well, creating the most resistance. A flat tire is
22 just simply creating resistance because of some increased
23 friction. So that would be least resistive type of
24 failure.

25 Q. Do you know what kind of failure happened



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App. 000228

1 here?

2 A. This appeared to be a blowout. It looked
3 like the side wall ruptured.

4 So I guess you can classify a tire failure
5 into three failures. One would be a very slow air leak.
6 We all get that when we get a nail in our tire and we
7 maybe hear a hissing noise, but we still have some time
8 to get to a shop.

9 Then there's a sudden failure, which is
10 either the side wall or the tread ruptures, either from
11 inconsistent wear or just failure within the structural
12 integrity of the tire. That is a sudden loss of air, but
13 you still have the tire underneath.

14 And then you get the tread separation where
15 the tread separates from the carcass, the air escapes
16 from the separation, and then the carcass is flapping in
17 the wheel well.

18 Q. Okay. So you would -- would you agree that
19 the Toyota, after the blowout here, would have been
20 pulling to the left?

21 A. Slightly.

22 Q. Okay. So you can't tell from the groove or
23 the tire mark where the blowout happened though, can you?

24 A. No. What I can say is what was documented.
25 She was on the right half of the left lane.



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App. 000229

1 Q. Okay. At some point?

2 A. At some point during or after the tire
3 failure.

4 Q. Okay.

5 A. Which again, if we extrapolate that -- I'll
6 let the jury do that extrapolation.

7 Is she simply riding the right side of the
8 left lane the entire time, or did she indeed come from
9 the center lane.

10 Q. Or it's possible she was centered in the left
11 lane, tries to go to the right, and then decides to pull
12 over to the left?

13 A. I suppose that's a possibility.

14 Q. Okay. Would you agree that if the Toyota had
15 been in the leftmost lane after -- when the blowout
16 occurred, Evelyn would have had to cross two lanes of
17 traffic to get to the right shoulder?

18 A. Yes.

19 Q. Okay. So your opinion here is that steering
20 to the right was equally possible. All right.

21 What engineering methods did you use to reach
22 that conclusion?

23 A. So that is a vehicle dynamics opinion. It's
24 not alluding to traffic. It is simply vehicle dynamic
25 driver input handling. With a slight pull to your left,



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App. 000230

1 you can still steer to the right.

2 Q. So when -- you say it was possible, right,
3 for her to get over to the right?

4 A. Mm-hmm.

5 Q. Okay. But you'd say it's equally possible
6 for her to get over to the right as opposed to the left
7 shoulder?

8 A. Yeah. Maybe the word "equally" is misleading
9 in regards to the amount of steering input. I'm
10 certainly not alluding to that amount of steering input;
11 I just mean that both are possibilities that you could
12 do.

13 Q. So, you know, I'm not going to ask you to
14 amend the report here. You agree that it would take more
15 steering input to turn the Toyota to the right after the
16 blowout than to turn it to the left?

17 A. A little bit.

18 Q. How much is "a little"?

19 A. I can't quantify that. Just qualitatively,
20 it would be a little bit more.

21 Q. Okay. So did you conduct a mechanical
22 inspection of the Toyota Camry?

23 A. There was an inspection done of the Toyota,
24 but it had been repaired at that point, so I'm relying on
25 the photographs of the Camry on the side of the road.



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App. 000231

1 Q. Okay. Have you conducted any experiments to
2 determine how a vehicle steers after a blowout?

3 A. No, and that's why I can't quantify this
4 particular vehicle. The literature does indicate there's
5 going to be a slight pull to the left, but it also
6 indicates that you can countersteer that pull.

7 Q. Okay. So let's go to your fourth opinion on
8 Page 4, or fourth and fifth. Can you read those for the
9 record?

10 A. "Rather, Ms. Evelyn Moreno parked the Toyota
11 still partially within the left travel lane, occupying
12 approximately 2.1 feet, not accounting for the side
13 mirror of the 11.6-foot-wide inside northbound travel
14 lane, providing approximately 9.5 feet of remaining
15 available space for northbound traffic to pass the
16 Toyota."

17 Q. Okay. Go to five as well.

18 A. Then five is, "Given the Ford's width of
19 approximately 6.6 feet, there was sufficient room for the
20 Ford to pass the Toyota within the remaining available
21 9.5-foot width of that left lane. It was not necessary
22 for the Ford to change lanes in order to pass the parked
23 Toyota."

24 Q. So -- and we'll focus on the last sentence
25 where you say, "It was not necessary for the Ford to



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App. 000232

1 change lanes." Do you mean it was not physically
2 necessary?

3 A. Correct.

4 Q. So in other words, there was enough room for
5 Caylee to remain in the leftmost lane and not directly
6 strike the Toyota?

7 A. Correct.

8 Q. Okay. You're not saying with this sentence
9 that it was prudent or reasonable for her to remain in
10 the leftmost lane?

11 A. No. That's for the jury.

12 Q. Okay. What is the error rate on the
13 measurements that you provided in these conclusions? Is
14 this -- if it's just a quarter inch...

15 A. I -- it's either a quarter of an inch, or
16 maybe even better, an eighth of an inch, but let me
17 double-check. It's certainly going to be within that
18 quarter of an inch.

19 Q. Okay. That's fine.

20 Why didn't you account for the side mirrors?

21 A. So in this case, side mirrors, number one,
22 are not often accounted for in an accident
23 reconstruction, number one, because they simply fold out
24 of the way. So the consequences of side mirror contact
25 typically are not -- are negligible, I should say.



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App. 000233

1 Number two, in this particular case, the side
2 mirrors actually did not align on an elevation
3 standpoint. There's actually at least a two-inch gap
4 between the bottom of the Ford Explorer's side mirror and
5 the top of the Toyota -- Toyota Camry's side mirror, so
6 they wouldn't cross paths. So it was negated, because it
7 didn't affect the measurements in this case.

8 Q. Okay. Do you agree that the crash would not
9 have occurred if Caylee Smith had gotten into the middle
10 lane when she first saw the Toyota Camry?

11 A. Of course. If the two parties didn't exist
12 at the same time at the same place, yeah, of course, the
13 crash would not occur.

14 Q. Okay. Do you agree that there's no evidence
15 that Caylee Smith was unable to get into the middle lane
16 as she approached the Toyota Camry?

17 A. I can't say one way or the other.

18 Q. Well, I'm just asking you, Have you reviewed
19 any evidence that says that it was -- she could not have
20 gotten into the middle lane as she approached the Toyota
21 Camry?

22 A. I haven't reviewed any evidence that tells me
23 one way or the other.

24 Q. Well, I -- I guess what I'm asking is, Have
25 you seen any evidence that shows you one way, which is

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App. 000234

1 that she could not have gotten into the middle lane as
2 she approached the Toyota Camry?

3 A. Correct, no, just like I hadn't seen evidence
4 of the other way.

5 Q. Okay. So you did conclude that the Ford
6 Explorer did not strike the Toyota Camry?

7 A. Correct.

8 Q. Okay. Is that partially because there's no
9 paint transfer?

10 A. Paint transfer is certainly one thing we look
11 for. Matching damage, damage characteristics is another
12 thing we look for. There was no matching damage to the
13 two vehicles.

14 Q. Okay. You did conclude that there was some
15 forward motion applied to the Toyota Camry though, right?

16 A. Yes.

17 Q. And is that because you saw that the jack
18 stand had been moved?

19 A. The jack stand had been tilted forward. And
20 my understanding is that was as a result of Nehemias's
21 being thrown into the back of the Toyota and also Evelyn
22 getting pushed into the back of the Toyota.

23 Q. So and I should have asked a predicate
24 question. Your understanding is that the jack stand had
25 been placed on the left side of the vehicle by the



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App. 000235

1 blown-out tire on the driver's side --

2 A. Yes.

3 Q. -- before the accident?

4 A. Correctly.

5 Q. And so presumably, it was correctly seated
6 before the accident?

7 A. Presumably.

8 Q. Okay. And then you saw via the pictures that
9 the jack stand -- basically, can you describe how it had
10 moved that allowed you to conclude that forward motion
11 had been applied to the Toyota Camry?

12 A. It tilted forward a little bit.

13 Q. Okay. As opposed to tilting laterally?

14 A. Correct, or backward.

15 Q. Or backward, right.

16 A. Mm-hmm.

17 Q. So if lateral force was applied to the
18 Toyota, how would the jack stand have moved?

19 A. It would have either slid or tilted.

20 Q. Okay. Tilted the same way it did in the
21 pictures you reviewed, or tilted to the side?

22 A. Well, it would tilt to the side that it was
23 pushed at.

24 Q. Okay. So the jack stand is sort of a good
25 barometer for the direction of the force applied to the



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App. 000236

1 Toyota, right?

2 A. Not the total direction of the force, because
3 you're certainly going to have resistive lateral force
4 from the tires themselves. A little bit of longitudinal
5 resistance from the right front axle, which is locked by
6 the transmission.

7 Q. Mm-hmm.

8 A. So you're going to have varying levels of
9 counteractive forces. So the net movement of the Toyota
10 doesn't tell you the total direction of the contact
11 force. It just tells you what the summation of the
12 forces resulted in.

13 Q. Okay. So you could -- do you have any idea
14 of the resistance of tires versus the resistance of the
15 front axle, which one -- which resistance is greater?

16 A. The lateral resistance is going to be
17 greater.

18 Q. The lateral resistance will be greater.
19 Okay. Got it.

20 So I think in your opinion -- this is on
21 Page 7 -- you said that the Toyota appeared to have
22 lunged forward by a few inches; is that right?

23 A. Yes.

24 Q. And you concluded there was no lateral
25 movement of the Toyota, correct?



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App. 000237

1 A. Correct.

2 Q. Now, is that the same as concluding that
3 there was no lateral force applied to the Toyota?

4 A. No.

5 Q. Okay. So it's possible there was lateral
6 force applied to the Toyota?

7 A. I do think there was a slight angle from
8 Nehemias's body probably coming from, I would say, the
9 5:00 or 4:00 direction, if 12:00 is straight ahead.

10 Q. Okay. So you think that his body was thrown,
11 if 12:00 is straight ahead, his body is thrown to the
12 4:00 to 5:00?

13 A. It came from the 4:00 to 5:00 direction.

14 Q. Okay. So if the middle of the Toyota has a
15 clock on it, you're talking the 4:00 to 5:00 point on the
16 Toyota is where Nehemias hit it?

17 A. Exactly.

18 Q. Okay. And you stated, I think it's later,
19 that, based on the tire marks created by the flat tire,
20 it didn't appear that there was a lateral movement,
21 right?

22 A. Correct.

23 Q. So meaning that the Toyota remained in that
24 groove or tire mark?

25 A. Right. Meaning the -- there were no forces



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App. 000238

1 applied to the Toyota that exceeded the lateral
2 resistance of the tires.

3 Q. Okay. So let's see. On Page 8, yeah,
4 that's -- your opinion is the Toyota did not move -- it
5 did move front to back but not laterally?

6 A. Correct.

7 Q. Okay. What damage occurred to the Toyota
8 Camry, to your knowledge?

9 A. The back right tail lamp housing, the plastic
10 housing was cracked; there was body matter transfer on
11 the back bumper inside of the trunk lid and on the right
12 quarter panel and also on the right rear door.

13 Q. Okay, okay. Were you aware that the trunk
14 would not close after the accident?

15 A. I was.

16 Q. Do you know how that damage occurred or why
17 it wouldn't close?

18 A. Likely due to contact forces applied to the
19 trunk lid itself from Nehemias's body being thrown into
20 the Toyota.

21 Q. Okay. Into the trunk lid?

22 A. Yes.

23 Q. Okay. So on Page 9, you say that the damage
24 to the Toyota is, quote, Consistent with post-impact
25 contact with the body of Mr. Nehemias Pivaral Santos's



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App. 000239

1 body; is that right?

2 A. That's right.

3 Q. All right. Can you explain how you reached
4 that conclusion?

5 A. So the contact with the Ford, we're starting
6 there, because that's what occurred first, and that's
7 what projected Mr. Nehemias into the Toyota. That
8 contact occurred at the left front corner with only his
9 head, which his head at that point was bent over, bent
10 down at an elevation of 3 to 3 1/2 feet from the ground
11 and extending beyond his center of gravity.

12 Any offset collisions outside of the center
13 of gravity is going to cause a rotation and also a
14 diagonal trajectory. We typically call this a fender
15 bolt, so it will throw you forward and to the side,
16 creating --

17 Q. Away from the force?

18 A. Away from the car.

19 Q. Okay.

20 A. So almost like a wedging effect is the best I
21 can say, so a diagonal throw. And that's really what
22 happened here was the offset contact with his head offset
23 from his center of mass and contact with the left front
24 corner of the Ford caused his body to rotate
25 counterclockwise and was thrown diagonally towards the



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App. 000240

1 Toyota at that 4:00 or 5:00 direction.

2 That then caused -- the contact between his
3 body and the Toyota occurred. His body essentially
4 bounced off of the Toyota back into the travel lane,
5 towards the Ford again. At that point, the Ford had
6 already progressed about 9, 10 feet. And then we see
7 this -- I guess it would be the third contact with
8 Mr. Nehemias's body against the left quarter panel of the
9 Ford as Mr. Nehemias bounced back into the Ford.

10 Q. Okay. So is any of the damage to the Toyota
11 circular in nature?

12 A. Not that I saw.

13 Q. Okay. Would you describe it as any other
14 shape, damage to the Toyota?

15 A. The damage to the Toyota looked consistent
16 with damage to blunt soft tissue versus any rigid, hard
17 objects.

18 Q. Okay. So you're saying you don't think his
19 head hit the Toyota?

20 A. I didn't see any evidence of that. It
21 certainly could have; it just didn't damage the Toyota.

22 Q. So I mean, there's brain matter and skull
23 fragments on the Toyota Camry, right?

24 A. Yes.

25 Q. So it's possible his head hit, but you're



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App. 000241

1 saying there's no damage to the Toyota consistent with a
2 head hit?

3 A. Right. The primary contact was to his head
4 from the Ford, which I think is what opened the skull.
5 Any secondary contact is going to be significantly less
6 in magnitude, because he's not picking up the entire
7 momentum of the Ford since it's that offset hit. So any
8 secondary or tertiary impact is going to be significantly
9 less in magnitude and may not cause physical damage.

10 Q. Okay. Do you have any opinion as to what
11 part of Nehemias Santos's body did hit the Toyota?

12 A. I don't have it refined to that specific
13 level.

14 Q. Okay. Any opinion on what part of
15 Nehemias Santos hit the taillight?

16 A. No. I don't have it refined to that specific
17 level.

18 Q. Okay. That's fine.

19 Any opinion on which part of Nehemias Santos
20 hit Evelyn Moreno?

21 A. No. I don't have it refined that much.

22 Q. Okay. Do you disagree or do you -- do you
23 believe that Evelyn Moreno's story that she was hit by
24 the body is inconsistent with the evidence?

25 A. No. I think it works.



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App. 000242

1 Q. Okay. How?

2 A. Well, she is standing in the trunk lid
3 opening. When you project a body after impact, the --
4 especially when you have an offset impact that causes
5 rotation, limbs are going to extend laterally
6 significantly due to that rotation. So the envelope at
7 which Mr. Nehemias's body was occupying post impact was
8 pretty wide. His body is going to occupy quite a --
9 quite a big distance from side to side. So it certainly
10 could have been his legs, could have been his arms, could
11 have been one leg, one arm, could have been his torso;
12 could be anything.

13 Q. And it's hard to tell, given the forces
14 applied and the fact that the human being is not
15 homogenous -- or, it is homogenous, right?

16 A. Well, it's articulated. So there's a lot of
17 articulation points that's going to cause it to flail and
18 flip and exist in a lot of different configurations.

19 Q. Okay. Your conclusion on Page 4 and
20 throughout is that the Ford Explorer struck
21 Nehemias Santos on the right side of his head, correct?

22 A. Yes.

23 Q. Okay. So on Page 11, you talk about contact
24 matching, right?

25 A. Yes. Sorry. You're flipping back and forth



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App. 000243

1 a lot.

2 Q. Sorry, sorry.

3 A. Yes.

4 Q. Okay. So is contact matching how you
5 concluded that Nehemias Santos's head was struck, that
6 the initial impact to Nehemias Santos was at the front
7 left panel or the front left part of the Ford Explorer?

8 A. Yes. You look at damage to one object versus
9 damage to the other, and it's simply putting the two
10 puzzle pieces back together.

11 Q. Okay. So -- and I believe you used the
12 phrase "circular contact damage" on the Ford Explorer?

13 A. Yes.

14 Q. All right. What does that phrase mean?

15 A. It is the shape of the damage profile to the
16 Ford.

17 Q. Okay. So if you'll flip to Page 54 of your
18 report -- the paper copy, actually. I'm going to ask you
19 to draw something. Can you draw for us on Figure 70
20 where the circular area of damage is?

21 A. You can't see it in that photo, but you can
22 see it quite well in Figure 70. And Figure 68 and 67 are
23 really good pictures as well.

24 Q. So let's -- let's do it on -- let's start
25 with 60- -- let's do 67 through 70, right?



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App. 000244

1 A. Actually, it goes back as far as -- 65 is
2 where you can start seeing the circular nature. 65 is a
3 good one.

4 Q. Okay. All right. Well, let's do 65 through
5 70. If you'll just take a pen --

6 A. Sure.

7 Q. -- and draw and put your initials.

8 MR. DUBOFF: Do we want to -- do you just
9 want to use red?

10 MR. WHITE: Yeah, red is probably better.

11 THE WITNESS: I don't have a red pen.

12 MR. WHITE: I might have a black pen.

13 MR. DUBOFF: I have about 14 red pens.

14 MR. WHITE: Oh, look at that. All right.

15 MR. DUBOFF: I like writing in red.

16 THE WITNESS: He's an angry writer.

17 MR. DUBOFF: It's these associates.

18 MR. WHITE: Yeah.

19 BY MR. WHITE:

20 Q. I just -- put your initials by it so they
21 don't think that, you know, sneaky opposing counsel put
22 it on there.

23 A. I think that's good. I marked Figures 65
24 through 70.

25 Q. Okay, perfect.



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1 What was the contact radius?

2 A. Consistent with the size of the head. I
3 didn't get a precise measurement.

4 Q. Okay. Could you measure the contact radius?

5 A. I suppose if I put enough analysis into that,
6 sure.

7 Q. Okay. You need at least half a circle to
8 calculate a radius, right?

9 A. Oh, I meant in the form of doing a
10 photogrammetry analysis.

11 Q. Okay. But you didn't here?

12 A. No. It was consistent enough.

13 Q. Okay. So you said it's consistent with the
14 size of a head?

15 A. Correct.

16 Q. How large was Nehemias Santos's head?

17 A. The general size of his head -- I was
18 provided some photographs of him before the incident.

19 Q. Okay. Do you have any measurements of
20 Nehemias Santos's head?

21 A. Not specifically. I can certainly estimate
22 it, just as I estimated this damage. They're both
23 consistent in nature and -- and rigidity. It was the
24 only thing that matched the characteristics of this
25 damage.



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App. 000246

1 Q. Okay. So are you saying that the damage is
2 not consistent with hitting his shoulder?

3 A. No, it's not, because you actually see the
4 brain matter on the end of the fender. The tip of the
5 fender was pointed, and he had a large hole in the right
6 side of his head, I guess you could say by the temple.
7 That fender, you can see the brain matter on the fender,
8 meaning that fender physically intruded into his skull.

9 Q. So can you point to which figure shows the
10 brain matter?

11 A. I'm going to look at my computer, because
12 these pictures are hard to see when they print. I need
13 to -- so I'm just cycling through the police photographs,
14 just to point out the chip of the skull was on Page 11 of
15 the police photographs.

16 Q. Did you include that photo in the report?

17 A. I don't know. Let me check. I may not have
18 just because of the intensity of the photograph. I don't
19 think I did.

20 Q. So just in the file that you sent me, can you
21 point me to the photo that has the skull chip that you're
22 referring to?

23 A. So if you go to Materials Received, Photos
24 and Videos, Police Photographs, Scene Photos, and then
25 it's going to be Page 11.



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App. 000247

1 Q. Now, I think we might be looking at something
2 different. Do you know the file name you're looking at?

3 A. 2200089-Photos, Part 1, Page 11.

4 Q. Got it, got it.

5 So the picture you're referring to, isn't
6 that a picture -- that's a piece of skull on the ground,
7 right?

8 A. Yes. I was just making a side comment as I
9 passed by it that I believe that is the puncture from the
10 fender.

11 Q. Okay. Well, I guess my question is, What
12 photo do you have that shows brain matter on the Ford
13 Explorer?

14 A. Yes, sorry. I'm going there. I just got
15 sidetracked while cycling through the photographs.

16 Q. And while you're looking, I'll point out on
17 Page 11, you say that, quote, There was blood and body
18 fluid/matter within the round contact damage,
19 specifically to the pointed leading edge of the left
20 front fender of the Ford," correct?

21 A. Yes.

22 Q. The next sentence says, "There were pieces of
23 skull and brain matter found on the roadway." So do you
24 think maybe -- I mean, I'm going off of your report,
25 right? Do you think the brain and skull is found on the



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1 road?

2 A. I think that the fluids in the damage with
3 the consistency of the peeled-back metal fender were all
4 consistent in size.

5 So damage match is generally looking at
6 multiple different configurations or --

7 Q. Sure.

8 A. -- match points, right? Like, a puzzle has
9 multiple jagged edges, that other puzzle's jagged edge.

10 So in this particular case, we had the
11 circular nature of the damage to the hood and the
12 headlight; we had the peeled-back fender with the body
13 matter on the inside and outside of the fender,
14 suggesting a puncture; we had the punctured skull on the
15 ground with the brain matter; we have all of the body
16 fluid within the circular contact that all of the jagged
17 edges lined up to establish that that was the point of
18 contact.

19 Q. Well, just to be specific, you don't see any
20 skull fragments on the Ford Explorer, do you?

21 A. No, no, I don't think I saw skull fragments
22 on the Ford.

23 Q. You don't -- you don't see obvious brain
24 matter on the Ford Explorer?

25 A. Yeah, I would just call it body matter. I



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1 don't know how much delineation we can do of that spray.
2 Certainly, there are chunks of brain on the ground that
3 are easier to identify. But within the fluid spray of
4 the contact damage, it's hard to identify, is that brain
5 fluid, blood? There's certainly --

6 Q. Okay.

7 A. -- a combination of fluids in there.

8 Q. Okay. So would you agree that it's possible
9 that the damage to the Ford Explorer by the headlight
10 that you've identified as circular damage could have been
11 caused by a shoulder?

12 A. I disagree, because now you are completely
13 missing what contacted his head.

14 Q. Okay. How do you mean?

15 A. We need to find a match. And if you put his
16 shoulder in place of where the head contact actually
17 occurred, now no head contact happens.

18 Q. To the Ford Explorer?

19 A. To Mr. Nehemias.

20 Q. Well, isn't it possible that Mr. Nehemias hit
21 his head on the Toyota or on the pavement?

22 A. Not based on the damage matching we see.
23 There is a nice fit. And suggesting otherwise would just
24 be purely speculative and ignoring the amount of match we
25 have here.



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App. 000250

1 Q. So let's talk about just matching on the Ford
2 Explorer, right? Is the contact on the Ford Explorer
3 inconsistent with a hit to Nehemias's shoulder, either
4 right or left?

5 A. It is. It's not as circular as his head.

6 Q. Okay. So is it possible -- is the contact
7 damage on the Ford Explorer consistent or inconsistent
8 with hitting Nehemias Santos's elbow?

9 A. Inconsistent.

10 Q. Okay. How come?

11 A. In size.

12 Q. Okay. What about a fist?

13 A. Inconsistent.

14 Q. Okay. And this is all based on -- you think
15 only a head stuck in front of the Ford Explorer could
16 have caused the damage to the Ford Explorer?

17 A. What I'm saying is the size, the shape, and
18 the magnitude of the damage is consistent with hitting
19 the size of a skull that is hard and would create a
20 circular imprint like we see in the Ford. There is no
21 other explanation for that damage other than your
22 speculation. What I do see here is a nice damage match
23 between his skull and the left front corner of the Ford.
24 There is nothing else that would cause the relative
25 contacts to both objects.



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App. 000251

1 Q. So are you saying that the contact damage on
2 the Ford Explorer could never be caused by impact with a
3 shoulder, a fist, or an elbow?

4 A. What I'm saying is it's not consistent with
5 that. I don't ever like to use the word "never" or
6 "always." We don't speak in absolutes.

7 Q. So it is possible?

8 A. What I'm saying is, to a reasonable of
9 engineering certainty, Mr. Nehemias's head contacted the
10 left front headlight of the Ford. That is the only
11 reasonable explanation for both characteristics to each
12 point of contact.

13 Q. I guess my question is, Is it possible that
14 the contact damage to the Ford Explorer was caused by
15 contact to a shoulder, an elbow, or a fist?

16 A. I don't think it is.

17 Q. So it's not possible?

18 A. I don't think it is. It does not exhibit the
19 characteristics of those other shapes.

20 Q. Okay. So what testimonial evidence -- so not
21 physical evidence, but depositions that you reviewed --
22 indicates that the initial impact to Nehemias Santos was
23 to the right side of his head?

24 A. Oh, everybody, I believe. They said he was
25 bending over picking something up, into the travel lane.



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App. 000252

1 Q. So did anyone testify that the initial impact
2 was to Nehemias Santos's head?

3 A. Well, to be fair, I don't know how much these
4 witnesses actually saw, despite what they said they saw.
5 But what I can say is their testimony indicated that he
6 was bending over, in the process of picking something up,
7 which is identical to the damage matching we see here.

8 Q. Okay. So you agree that -- can we agree that
9 no witness has testified that the initial impact was to
10 the right side of Nehemias Santos's head? That's just
11 not something someone said? You're inferring it, but
12 that's not been said by anybody?

13 A. Well, I'm not inferring it; I'm concluding it
14 based on the damage matching.

15 Q. Okay. But there's no separate testimony from
16 somebody that says, Nehemias Santos, I saw his head get
17 hit by the Ford Explorer"?

18 A. I'd have to reread it, but I'll take your
19 word for it. Certainly, this analysis is based on
20 objective evidence --

21 Q. Okay.

22 A. -- not testimony, so I simply just make
23 comparisons.

24 Q. Okay. So can we agree that your opinion in
25 this report is that there's no damage to the Ford



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App. 000253

1 Explorer below the 3-foot mark?

2 A. Correct, on the front face.

3 Q. On the front, you're right.

4 We agree that there is damage on the side of
5 the Ford Explorer below the 3-foot mark?

6 A. Correct.

7 Q. Okay. So is that an important part of your
8 opinion, not an important part? I -- I'm just -- I want
9 us to nail it down.

10 A. Well, everything is important. I don't want
11 to give anything more merit than another, but that is
12 certainly a key component in that there is no existence
13 of Mr. Nehemias below that contact point.

14 Q. So are you able to infer -- from the contact
15 matching and the lack of damage below the 3-foot mark,
16 that's how you've reached the conclusion that is shown in
17 some of your figures that Nehemias was leaning forward
18 with his head out from his body, and only his head was
19 struck initially, right?

20 A. Exactly. It's quite a smoking gun with --
21 when you put all of the jagged edges together of the
22 puzzle piece, it's the only puzzle piece that fits.

23 Q. Okay. Now, there's no damage to the Ford
24 Explorer that you've been told about from one of
25 Caylee Smith's prior accidents, right?



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App. 000254

1 A. My understanding was there was no damage to
2 the left front corner prior to.

3 Q. Okay. At all? Like, I mean, I just -- I
4 want to make sure, you know --

5 A. Well, certainly not to this extent.

6 Q. Okay. So -- but you were never told that
7 there was some damage on the Ford Explorer, but that was
8 caused by one of Caylee Smith's prior accidents in the
9 Ford Explorer?

10 A. I was never told that. But again, this
11 damage has Mr. Nehemias's blood in it, so I don't know if
12 I necessarily needed to be told that.

13 Q. Fair enough.

14 I just -- I want to make sure that, coming
15 into this investigation, your assumption or what you
16 concluded was that the Ford Explorer was in -- I don't
17 want to say perfect condition, but there was no body
18 damage or mechanical damage to it prior to impacting
19 Nehemias Santos?

20 A. I think that assumption may be more important
21 when you don't have a lot of damage to work with. But in
22 this particular case, we have such strong matching
23 evidence that there is no question of if it was
24 preexisting.

25 Q. So -- and it's not just not matching evidence



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App. 000255

1 that you're relying on; it's the lack of other damage
2 that would -- you know, that kind of -- that's how you're
3 able to infer where the damage happened to
4 Nehemias Santos, right?

5 A. Well, it's everything, all of it together.
6 It's the elevation of the damage, the size of the damage,
7 the exact location of the damage inboard, the
8 characteristics of the damage itself consistent with the
9 characteristics and rigidity of a skull, the body matter
10 in the damage itself, the brain matter on the road, the
11 skull piece on the road consistent with the fender tip.
12 Everything is so overwhelmingly consistent that there is
13 no way, to a reasonable degree of engineering certainty,
14 that we can conclude anything else.

15 Q. Fair enough. All right.

16 Would you agree that any evidence of damage
17 to the front of the Ford Explorer below 3 feet would
18 require you to revisit your conclusions?

19 A. No. Because in addition to that, if
20 Mr. Nehemias's body existed below that damage, now you're
21 applying the force closer to his center of mass. He is
22 now going to be projected more forward than lateral, and
23 he's going to be subsequently run over because of the
24 trajectory of the Ford. He's going to essentially
25 inherit the trajectory of the Ford because of all the



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App. 000256

1 momentum transfer if his body was struck by the front
2 bumper.

3 Q. Okay. So you think -- so if there was damage
4 below the 3-foot mark on the front, that would imply that
5 Nehemias Santos had moved more forward than laterally?

6 A. Yes, which would not result in the subsequent
7 damage we see on the Toyota, would not result in the
8 subsequent damage we see to the left quarter panel of the
9 Ford. There is no other solution that matches all of the
10 evidence. There's one unique solution that matches every
11 piece of evidence. We can't ignore evidence; we have to
12 consider it all.

13 Q. Sure, sure.

14 So one of the pieces of evidence is the lack
15 of damage to the front end of the Ford Explorer below the
16 3-foot mark, right?

17 A. One of the many is the lack of damage that
18 would be generated from impacting a center of mass of a
19 body.

20 Q. Fair enough. All right.

21 So go to Figure 70 of your report.

22 A. Okay.

23 Q. I think that's page -- well, you beat me
24 there. All right. So if you look down, you see the
25 tire, right?



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App. 000257

1 A. I do.

2 Q. Now, you see that there's sort of a -- the
3 plastic piece that's kind of been ripped off a little
4 bit?

5 A. I do.

6 Q. Go down to that -- it's not the bumper, but
7 it's the plastic bit below the white bumper on the front,
8 right? Do you see any deformation of that part of the
9 plastic bumper?

10 A. Let me just see it on my computer. Okay. I,
11 do.

12 Q. Okay. So go to Page 14 of the Richland
13 police officer's photos. I actually don't see it in your
14 file. Recall that?

15 A. No, I don't have a Page 14.

16 Q. Well, I'll show you mine. So this is -- and
17 this is the 14th page of --

18 A. Oh, that's in a different folder. That's
19 why.

20 Q. Oh, okay. Which folder is it in on yours?

21 A. That would be under the Ford Explorer folder.

22 Q. Okay. Let's go back to the Ford Explorer
23 photo, then. Ah, yes, there it is, Page 14.

24 A. Okay.

25 THE VIDEOGRAPHER: I'm sorry. Is your mic



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App. 000258

1 still clipped?

2 THE WITNESS: Oh, I walked away. Sorry.

3 THE VIDEOGRAPHER: That's okay. Thank you.

4 THE WITNESS: You're welcome.

5 BY MR. WHITE:

6 Q. Okay. Do you see the dent in the lower part
7 of the front plastic bumper?

8 A. I do.

9 Q. Okay. So did you miss that dent in your
10 analysis?

11 A. No. That's just not a dent from impacting
12 the center of mass of a pedestrian.

13 Q. So -- but that is damage below the 3-foot
14 mark on the front part of the Ford Explorer, isn't it?

15 A. Yeah, I guess you're right. Maybe I should
16 have been more specific in my words. But that damage is
17 not from impacting the center of mass of a pedestrian.
18 That also could have been generated by his shoes or
19 debris or even the bending of the black plastic trim. So
20 whatever caused that damage was not Mr. Nehemias's
21 physical body in front or existing in front of the Ford,
22 because we would see damage between that and the
23 headlight, but we do not.

24 Q. So on the bottom of Page 8, you say, quote,
25 "There was no front face contact damage below 3 feet from



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1 the ground." Would you want to revise that statement?

2 A. No. That's really on the left-side corner.
3 It's a plastic damage that, again, could have been as a
4 result of the bending of the plastic fender.

5 Q. So you think that the bending of that bumper
6 was caused by the bending of the fender?

7 A. Well, I'm suggesting that could be an
8 explanation. His shoe being thrown off could be an
9 explanation, a tool he was holding could be an
10 explanation. That is not contact with a body, and that's
11 what we're talking about.

12 Q. Okay. So how -- if, in your theory, he
13 sticks his head out into the road to get hit by the Ford
14 Explorer and then gets hit by the Ford Explorer, and
15 then, as you say, he doesn't get into contact with the
16 Ford Explorer again until it's kind of at 9 feet, how do
17 his shoes create that damage to the front bumper?

18 A. When you are hit offset from your center of
19 mass, your limbs will flail outward significantly. So we
20 are articulated. Our elbows, shoulders, that could be
21 any of the articulation points as he's rotating or
22 spinning. It could be his legs; it could be his shoes,
23 his feet, his hands; it could be a multitude of things.
24 But what it is not is his physical center of mass.

25 Q. Okay. So if, as you said, he gets hit in the



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App. 000260

1 head, in your estimation of what happened, he spins
2 counterclockwise, right?

3 A. Yes.

4 Q. So the front bumper would have been past his
5 body at that point when the spin begins, right?

6 A. Yes. But again, your limbs --

7 Q. But how does he get in front of the car after
8 he's been hit to cause that damage?

9 A. Right. So if you actually look at the
10 demonstrative I have of him bending over, the diagram,
11 you can see his hands hanging in that general area. That
12 could certainly be an explanation for that dent. That
13 could be preexisting.

14 What I am saying -- and I think you're
15 missing the point -- this is not contact with the center
16 of mass of his body. And that is the point I'm making is
17 that the only way to exhibit this elevated contact to the
18 headlight without significant body damage to the bumper
19 itself means the lack of existence of his body in between
20 or below the headlight. Now, what this dent in a piece
21 of plastic is, I don't know. But it doesn't matter.

22 Q. Because you didn't mention it your report,
23 did you?

24 A. No. And again, it doesn't matter, because
25 what I'm saying is there is no body -- center of mass



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App. 000261

1 body contact.

2 Q. Okay. So let's go to Page 14 --

3 MR. WHITE: Oh, I'm sorry. Let's take a
4 break.

5 THE VIDEOGRAPHER: The time is 2:18 p.m. We
6 are off record.

7 (Break was taken from 2:18 p.m. to 2:24 p.m.)

8 THE VIDEOGRAPHER: The time is 2:24 p.m., and
9 we are on record.

10 BY MR. WHITE:

11 Q. Okay. I want to jump to Page 14, right? On
12 Page 14, you say, quote, had Mr. Santos not bent over
13 into the travel lane outboard the parked position of the
14 Toyota, the collision would not have occurred, correct?

15 A. Correct.

16 Q. Okay. Now, are you offering the opinion that
17 Mr. Santos bent forward immediately before being hit by
18 the Ford Explorer?

19 A. I can't offer that opinion. I don't know.

20 Q. But you say, right, you don't know -- you --
21 your opinion is he was bent over when he got hit?

22 A. Correct.

23 Q. But you don't know when he began bending over
24 or how long he'd been in that position?

25 A. Correct. Another reason I can't do an



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App. 000262

1 avoidance analysis, because I don't know when that
2 stimulus began.

3 Q. Okay. So do you -- I take it you don't know
4 how long he was in the bent position before he was hit by
5 Caylee Smith?

6 A. I don't.

7 Q. Okay. Did you take body measurements of
8 Mr. Santos in this case?

9 A. No. I had pictures of him to establish that
10 he was a generic, 50th percentile male.

11 Q. Okay. So did you use 50th percentile male
12 proportions when creating your demonstratives?

13 A. I did.

14 Q. Where are those percentiles found out?

15 A. Did I publish that in my file? Let me see.
16 If not, I can add it in there really quick. Yeah, I
17 apologize. I don't think I added that in there. But the
18 CDC publishes the Anthropometric Reference Data Manual,
19 last dated January 2021.

20 Q. Do you believe the CDC? I'm joking.

21 Okay. Why -- why didn't you also say that
22 this collision would not have occurred if Caylee Smith
23 had vacated the leftmost lane when she first saw the
24 Camry?

25 A. Well, I did concede that, had she been able



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1 to move over by another foot, there was no crash. But I
2 can't say whether she was capable of vacating that lane.

3 Q. Okay. So your eighth opinion on Page 4,
4 right, you're talking about some tire marks that were
5 photographed to the right of the Toyota?

6 A. Yes.

7 Q. Okay. So your conclusion was, quote, The
8 location and characteristic of these tire marks were
9 indicative of one or more vehicles making an invasive
10 swerving maneuver from left to right at the location of
11 the parked Toyota.

12 A. Yes.

13 Q. Okay. So -- and you made that determination
14 by comparing the grooves in the tire marks with the
15 grooves on the tread of the Ford Explorer?

16 A. Well, that opinion wasn't based on the
17 grooves.

18 Q. Okay.

19 A. The grooves were what was able to indicate
20 that those were not the Ford Explorer's tires.

21 Q. So -- and just so we're both looking at the
22 same picture here, Figure 88, right? So you identified
23 two patterns in Figure 88, right?

24 A. Yes.

25 Q. So the leftmost of those patterns, you have



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App. 000264

1 on Figure 88 only as three tread grooves, right?

2 A. Yes.

3 Q. So that groove or that tire mark, you've
4 excluded as being caused by the Ford Explorer, because it
5 has fewer grooves than are on the Ford's tread?

6 A. Exactly.

7 Q. Okay. Now, there's another tire mark to the
8 right of the one with three tread grooves. And the
9 tread -- the tire mark to the right, you couldn't count
10 the number of grooves in it, could you?

11 A. I could not.

12 Q. All right. And you excluded that one based
13 on the width of it?

14 A. Yes.

15 Q. Okay. So how did you measure the width of
16 that tire mark?

17 A. That was done with a photogrammetry analysis.

18 Q. Okay. So if you look at the tire mark that's
19 to the right, the one that you couldn't count the grooves
20 on, does it look like it displaced -- or that the tire
21 that made that mark also displaced some fluid?

22 A. It's hard to say whether that fluid is on top
23 of the tire mark. What I would expect if it displaced
24 fluid is we would be able to see the tread grooves
25 better. The reason I don't think we can see the tread



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App. 000265

1 grooves is because I think there's a little bit of
2 lateral slippage that just misaligns the grooves ever so
3 slightly.

4 And when you look ahead at the tire mark more
5 towards the top of the picture, that gives more of the
6 textbook outboard characteristics of a loaded tire. When
7 you swerve, you are causing a weight shift to one side of
8 the vehicle, which is going to load that side's tires.
9 Anytime you overload a tire, it's going to give that
10 characteristic textbook tire mark.

11 Q. So on Figure 88, for the tire mark to the
12 right, you've actually added some black lines, right, to
13 kind of show us where the boundary of the --

14 A. At the bottom of it, yes.

15 Q. Right.

16 A. Mm-hmm.

17 Q. Can you say definitively that that tire mark,
18 the one where you couldn't count the grooves, that that
19 tire mark is actually caused by rubber being put on the
20 road or displaced fluid that, like, track the tire?

21 A. That's what I'm saying. If it was displaced
22 fluid of a tracking tire, which means it's free rolling
23 in line with its angle, you would be able to see more of
24 the tread grooves from going through fluid.

25 Q. But you would agree that it looks like some



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App. 000266

1 of that fluid has been displaced by a tire in line with
2 the tire mark that you've identified where you can't
3 count the grooves, right?

4 A. I would argue it looks more of, like, a
5 classic tire mark with some fluid on top of it by the
6 black lines.

7 Q. Okay. So if there's fluid on -- you don't
8 think that that fluid that's on top of it was caused by a
9 tire rolling through the fluid?

10 A. I don't think so. That, I'm not going to
11 fight hard on. It's certainly possible, but I don't
12 think so.

13 Q. Okay. Because if that tire mark was caused
14 after the fluid was on the ground, then that tire mark
15 happened after the accident --

16 A. Right.

17 Q. -- right?

18 And it's possible that both, or one of, at
19 least -- and we don't know that these tire marks were
20 caused before the accident, right?

21 A. I can't say exactly when they were generated.
22 What I can tell you is the characteristics of them and
23 the exact location and size of them. That's what I
24 figured out.

25 Q. So you said that it appeared that they



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App. 000267

1 were -- let's see here -- indicative of one or more
2 vehicles making an evasive swerving maneuver, right? So
3 where did you get that those tire marks were caused by a
4 vehicle making a swerving evasive maneuver?

5 A. So they arc to the right at angles consistent
6 with emergency swerving with loading patterns consistent
7 with the weight shift. During an emergency swerve, the
8 weight is going to get thrown to the left side of the
9 vehicle, overload those tires, generating that textbook
10 outboard dark line patch along with the curvature of the
11 mark.

12 When you actually put this on a diagram, you
13 can appreciate the curvature of the mark, because this is
14 a very zoomed-in photo. You're only segmenting a small
15 portion of a curve. It's hard to see, kind of like
16 flat-earthers, I should say. But this -- when you look
17 at a diagram, you can appreciate the swerving nature of
18 the tire mark.

19 Q. So -- but you don't know if those tire marks
20 in your -- well, strike that.

21 Your opinion is that these tire marks were
22 caused by someone swerving?

23 A. Yes.

24 Q. Okay. But you don't know if these swerves
25 were made as a result of someone trying to avoid the



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App. 000268

1 Camry, or if those swerve marks were put there before the
2 Toyota Camry was there?

3 A. You are right.

4 Q. Okay. All right. And can we agree that it's
5 possible those track marks were made after
6 Nehemias Santos was killed?

7 A. I would probably fight harder on the left
8 tire mark than I would on the right tire mark. I do
9 think that left tire mark is prior to. I think that has
10 more classic characteristics of a real tire mark versus a
11 tire traveling through fluid.

12 Q. Okay. So your ninth conclusion on Page 4 is
13 that there was no physical evidence or indication in the
14 GPS data or the bearing data that the Ford was traveling
15 or steered on or towards the left shoulder leading up to
16 the incident location, as suggested by the plaintiff?

17 A. Yes.

18 Q. Okay. So one of the reasons you reached that
19 conclusion is based on the bearing data from the
20 infotainment center, right?

21 A. That's correct.

22 Q. Okay. And let's see here. So if you can
23 flip to Page 12 of your report.

24 A. Okay.

25 Q. All right. So just -- I won't make you read



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App. 000269

1 all this. But just to summarize your opinion here, you
2 say that the bearing data shows that she was traveling
3 with a -- quote, consistent with the parallel orientation
4 with the roadway leading up to the collision location.

5 A. Exactly.

6 Q. So is that -- you know, I don't -- we'll go
7 back to our questions about GPS and whatnot. But you're
8 not swearing that the GPS data is 100 percent precise as
9 to global position, but you do think that looking at all
10 the GPS positions in a line shows that she was moving
11 along the roadway in a straight fashion?

12 A. Yes. I believe you can establish trends from
13 data points that all have the same tolerance.

14 Q. Okay. And you say there's no documented
15 positional deviation from the left northbound travel lane
16 towards the left shoulder in Caylee's track points?

17 A. Yes.

18 Q. So what you're saying is there's nothing in
19 the electronic data that shows that she went left on the
20 leftmost lane, like, towards the left shoulder?

21 A. Correct. She never deviated to the left, nor
22 did the bearing data or the bearing angle indicate that
23 she moved left.

24 Q. Okay. So are you relying on the bearing data
25 there? Do you trust the bearing data?



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1 A. Well, what I'm saying is when you combine all
2 of this, that's the likely conclusion.

3 Q. You've validated the bearing data; the
4 bearing data lines up with everything else, is what
5 you're saying?

6 A. When measured, the bearing data matches the
7 roadway orientation --

8 Q. Okay, okay.

9 A. -- until her final swerve.

10 Q. Okay, right, right, right.

11 So -- and you admit there's a little bit of
12 wiggle room here on the GPS coordinates, because they've
13 been validated to only 3 1/2 to 7 1/2 feet? That's your
14 position?

15 A. The global position. But again, we're using
16 the theory of relativity, and we're taking a rather small
17 time sample and analyzing the change between points and
18 tracking any trends or changes in those points to help us
19 establish any relative movement. Since we know all of
20 these points have relatively the same error rate, because
21 they're collected in the same time frame at the same
22 environmental location with the same number of satellite
23 signals, we can conclude that, if there was any deviation
24 in lateral position or bearing, we should see it.

25 Q. Okay. All right. So I take it what you mean



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1 is we don't know exactly where she's at on the road from
2 the GPS data within 3 1/2 to 7 1/2 feet, but we can tell
3 that she was going straight, wherever she was in that --
4 on the roadway, right?

5 A. Right. It's kind of like the difference
6 between accuracy and precision. Accuracy is where on the
7 road you are; precision is the consistency of the data.

8 Q. Okay, okay. So your conclusion is that the
9 3 degrees -- well, strike that.

10 Let's -- just for the jury, can you explain
11 the bearing data? Like, how does bearing work, like, if
12 you're looking at a quadrant compass?

13 A. So there's 360 degrees in one full circle,
14 90 degrees in a quarter circle. So if you rotate
15 90 degrees to your right, you rotate a quarter of the way
16 around; 180 is one-half the way around. So 3 degrees is
17 just a slight steer to the right relative to the whole
18 360.

19 But what the vehicle dynamic principles show
20 is that, at highway speeds, particularly at 90 miles per
21 hour, when we apply the emergency swerving equations to a
22 vehicle traveling at these speeds, the maximum bearing
23 angle during that swerve is about 3.1 degrees, which
24 precisely matches the bearing angle change that we see
25 around the location of impact.

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1 So we know that data is capable of picking up
2 these changes in lateral position and bearing angle. We
3 see the lateral position deviate to the right, and we see
4 the bearing angle deviate clockwise. So we know it's
5 picking up changes, and we see no changes before then.

6 Q. Okay. So you're saying the literature shows
7 that an emergency swerve to the right would normally, at
8 most, be 3 degrees to the right?

9 A. At the speed.

10 Q. At the speed, right.

11 So the fact that the infotainment bearing
12 data showed a 3-degree swerve to the right helps you
13 validate the data from the bearing?

14 A. One of the many validations, yes.

15 Q. Okay. But I -- you trust the bearing data?
16 That's where you're at?

17 A. Yeah. I mean, certainly, I admit that there
18 are tolerances and errors. But what I can say is I've
19 independently analyzed it, and it appears to be accurate
20 in this case. We always try to independently validate
21 digital data --

22 Q. Sure.

23 A. -- to see its accuracy, and it matches very
24 well with the environmental evidence and the vehicle
25 dynamic principles.



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App. 000273

1 Q. So there was a swerve -- well, I'll take a
2 step back. At the 2:48:51 mark, her bearing is 340
3 degrees, right?

4 A. Yes.

5 Q. And then the next second, her bearing is 343?

6 A. Yes.

7 Q. And so that's where we're getting the
8 3-degree change, right?

9 A. You got it.

10 Q. How many feet in lateral change does that
11 correspond to, and how do you calculate that?

12 A. Lateral feet over the course of -- looks like
13 anywhere between 130 and 250 feet of longitudinal
14 distance --

15 Q. Well, just -- and I'll interrupt you.

16 It's a right-hand -- it's a right angle
17 triangle, right? So all you're doing is once you know
18 the degree change, right, you can figure out what the
19 distance is between the track that she would have been on
20 without the bearing change versus the longitudinal
21 distance that she travels, and then you can -- you can
22 calculate the change, right?

23 A. It's not that simple, because you don't
24 instantly change angles like the corner of a triangle
25 does. It's a quadrantic curve --



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1 Q. Okay.

2 A. -- that you gradually quadratically increase
3 your heading angle. So it's more complicated than just a
4 triangle. But what I can do is look at the empirical
5 equations to calculate the lateral movement.

6 Q. So what is the lateral movement of a 3-degree
7 swerve to the right like the one that she conducted?

8 A. Let me see.

9 Q. And tell the jury; sort of walk us through
10 how you figure it out.

11 A. So what I'm doing is I'm using the equations
12 where the inputs are speed and lateral steering distance
13 side to side, and it establishes what the average lateral
14 acceleration -- the rate at which you are changing
15 laterally -- that's what defines the curve. It's not an
16 instantaneous change like a triangle, it's a curve, and
17 then also the lateral movement during that time of that
18 distance segment. And so I don't have that teed up, so
19 I'm having to do this iterative process to answer your
20 question. It's about 5 feet.

21 Q. Okay. All right. That's -- and I'm not an
22 engineer. I just used a triangle, and I came up with
23 about 6 feet, so --

24 A. All right.

25 Q. -- I'm close enough, right? I have nothing



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1 better than the Pythagorean theorem to use, so you have
2 better tools, okay?

3 So what was Caylee's bearing when she sent
4 the text message to Gracie?

5 A. I don't have that teed up, but I can
6 certainly try to go look for that.

7 Q. And just -- I think we agree that the text
8 message happened at the 2:48:43 mark.

9 A. Okay. Her bearing at 2:48:43 was
10 340 degrees.

11 Q. And we agree that's her bearing when she sent
12 the text message?

13 A. Yes.

14 Q. Okay. So how fast was she going when she
15 sent that text message to Gracie?

16 A. 87.8 miles per hour.

17 Q. Okay. And round it up to 88?

18 A. Sounds good.

19 Q. Okay. So she was on the 340 bearing for
20 about three seconds, right?

21 A. Until when?

22 Q. Well, about three seconds later, does she
23 change her bearing?

24 A. There's a 341, 340, there's some rounding.
25 It rounds to the nearest whole number.



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1 Q. So at what second did her -- so she's on the
2 340 bearing after sending the text message. At what
3 second does she change her bearing to 341?

4 A. Like, about five and a half seconds before
5 impact.

6 Q. So it's about three seconds after sending the
7 text message, right?

8 A. Sure.

9 Q. Okay. So a change from 341 to -- excuse me,
10 a change from 340 to 341 is, what, a rightward shift?

11 A. Yes.

12 Q. Of about how many feet using the calculation
13 you used earlier?

14 A. Well, the problem is you're rounding. That
15 very well could have been a 340.4 at one moment and then
16 a 340.5 at the next one, and it's going to round to the
17 next whole number. So --

18 Q. How do you know that it's rounding to the
19 whole number?

20 A. Because the precision -- they only give us
21 whole numbers.

22 Q. Okay. So you don't know which way it's
23 rounding, right?

24 A. Well, it depends on which side of the half
25 it's on.



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App. 000277

1 Q. Well, you don't know how close it is - --

2 A. No.

3 Q. -- when they round up, right?

4 A. Right. And that's why this hypothetical
5 question is tough, because I don't know where within that
6 range it actually was.

7 Q. Let's say it's a full degree. Let's just
8 take the data as it shows, right? It's a full degree
9 change from 340 to 341, right, traveling at the speed at
10 which she is at when she makes the bearing change, so
11 that's 85 miles an hour. How many lateral feet to the
12 right has she moved?

13 A. It's going to be about less than a quarter of
14 a foot, so 3 inches.

15 Q. Okay. So she's gone right.

16 Now, does she change her bearing back to 340
17 in the next second?

18 A. Well, the data either rounds to 340 in the
19 next second, but I don't know if it's necessarily her
20 changing it back to 340. But certainly, as you drive,
21 you are going to be putting adjustments into your
22 steering, but very slightly, to maintain a straight
23 heading. So anything less than 1 degree, you're just
24 getting way too precise.

25 Q. Okay. But the bearing does change in the



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1 next second back to 340, right?

2 A. It could round back, yeah. I mean, if it --

3 Q. Well --

4 A. -- if it was at --

5 Q. -- I'm just saying just look at it.

6 A. Yeah, yeah. The physical data goes 340, 341,
7 because, again, we're rounding.

8 Q. Okay. So at the 2:48:47, she's got a bearing
9 of 340; and then the next second, she goes to 341 again,
10 right?

11 A. Okay, yes.

12 Q. Okay. And so then she goes back to 340 in
13 the next second, right?

14 A. Or it rounds down to 340, yeah.

15 Q. Okay. And then she's on 340 until the
16 collision occurs and she moves 3 degrees to the right?

17 A. Right.

18 Q. Okay. So do you think the 3-degree move is
19 the result of -- could it be -- could it be closer to
20 2 degrees?

21 A. You're right. It's possible. It could be 2
22 to 4, really.

23 Q. Okay. We just don't know?

24 A. Yeah, I mean, because of rounding. It's
25 going to be anywhere between that 2 to 4, but the 3 is



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1 the central value.

2 Q. Right. And you don't know, like, from your
3 expertise and from reviewing the literature, how accurate
4 the bearing data is on these Gen 3 SYNC devices, right?

5 A. Right. And again, I'm not establishing her
6 trajectory based on the bearing data. What I'm saying is
7 I've independently calculated what the maximum bearing
8 angle change would be using an emergency swerve at her
9 speeds, and it equates to 3.1.

10 Q. Okay.

11 A. And I look at the bearing data on the GPS
12 data, and it shows 3 degrees. So I'm saying it's
13 consistent.

14 Q. Okay, okay. So you've read Caylee's
15 deposition, right?

16 A. Yes.

17 Q. So your testimony -- or her testimony is that
18 she never left the left lane as she approached the Toyota
19 Camry, right?

20 A. Yeah. It was a little vague on whether she
21 actually breached the middle lane or not. But I think at
22 the end of the day, my consensus or my understanding of
23 her testimony was that she didn't actually breach the
24 center travel lane --

25 Q. Well, she --



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App. 000280

1 A. -- until after.

2 Q. She thinks she didn't breach the center
3 travel lane --

4 A. Right.

5 Q. -- right? That's her testimony, right?

6 A. Mm-hmm.

7 Q. So -- and did you assume that was the case
8 while you were generating your report?

9 A. Well, I was presented two versions, right? I
10 don't know the exact lateral position of anyone at
11 impact. So what I did was analyze the two versions that
12 are in dispute, Plaintiffs' version and Defense's
13 version, and I'm presenting both of those for the jury,
14 and they can choose.

15 Q. Okay. So now, if she -- if we assume that
16 she's in the left lane -- and that is her testimony,
17 right?

18 A. Right.

19 Q. If she -- that 3 degrees swerve to the right
20 would have put her in the middle lane, right?

21 A. Yeah.

22 Q. Okay. How far in the middle lane?

23 A. Well, we said what, 5 feet?

24 Q. Mm-hmm.

25 A. Mm-hmm.



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App. 000281

1 Q. So about -- was it about halfway in the
2 middle lane?

3 A. Depends where she started from.

4 Q. Well, taking her testimony as true, right?

5 A. Mm-hmm.

6 Q. You know, that she's trying to avoid the
7 Toyota Camry but not be in the middle lane --

8 A. Right.

9 Q. -- about how far -- how far away is she from
10 the middle lane at that point?

11 A. Yeah. I mean, she's about 5 feet into the
12 middle lane, which is quite consistent with the GPS
13 position --

14 Q. Okay.

15 A. -- that we see.

16 Q. So you would agree that when she swerved to
17 the right, according to the GPS and the bearing, she went
18 about 5 feet in the middle lane?

19 A. Yeah, I think she at least breached the
20 middle lane after her swerve for sure.

21 Q. Sure, sure.

22 How wide is the middle lane?

23 A. I think it's also about 11 to 12 feet wide.

24 Q. Okay. So she, at -- at maybe the maximum
25 point of her swerves, she's taking up half of the middle



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App. 000282

1 lane, right?

2 A. Sure.

3 Q. Okay. So how much damage was on the right
4 side of the Ford Explorer?

5 A. None.

6 Q. Okay. So you'd agree that means that she
7 didn't hit anybody on her right when she swerved at the
8 collision point?

9 A. That's true.

10 Q. Okay. So why didn't you include in your
11 report, "The middle lane was empty to Caylee Smith's
12 right at the point of impact"?

13 A. All I can tell you is the point of impact
14 what the status of that middle lane is. We all know lane
15 status can change within seconds. I have no idea what
16 her lane status was five, ten seconds prior, which is the
17 timing of when somebody would start implementing a lane
18 change. Nobody can attest to what the status of that
19 lane was five to ten seconds out. All we can attest to
20 is at the point of impact, she was able to exist in that
21 center lane. That tells us nothing about her ability to
22 be able to change lanes back in time.

23 Q. Okay. And you would agree, Caylee Smith
24 doesn't remember if there was anybody in the middle lane?

25 A. Yeah. Her -- she couldn't remember



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1 specifically. I think there was -- yeah, I'll just agree
2 with that.

3 Q. Okay. So your conclusion is that
4 Mr. Santos's head must have been 1.1 feet east of the
5 outward or the rightmost point of the Toyota Camry?

6 A. Yes.

7 Q. And that's due to your equations saying that
8 the maximum degree swerve that Caylee Smith could have
9 conducted was 3.3 degrees?

10 A. I thought it was 3.1, but you might be right.

11 Q. I'll take your word for it.

12 A. I'm not sure.

13 Q. What is your equation that you're using?

14 A. That is, again, based on the steering
15 amplitude from Muttart's 2015 paper, 2015-01-1417.

16 UNIDENTIFIED SPEAKER: I'm sorry. I couldn't
17 see you from the --

18 THE VIDEOGRAPHER: One moment.

19 MR. WHITE: I thought it was locked.

20 MR. DUBOFF: Yeah, I thought it was a dead
21 bolt.

22 BY MR. WHITE:

23 Q. Okay. So in -- I take it that equation is
24 based on the speed at which someone is traveling, right?

25 A. That is a variable, yes.



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1 Q. Okay. So you can swerve more the -- your
2 degree of swerve can be greater if you're going slower,
3 right?

4 A. True.

5 Q. Okay. How much greater? Like, is it a
6 sliding scale?

7 A. It's a quadratic. I don't have an answer to
8 that.

9 Q. Okay, okay. So that paper says that the
10 maximum that Caylee Smith could have swerved to the right
11 was 3.1 degrees?

12 A. With these set of facts, yes.

13 Q. Okay.

14 A. Her speed and the emergency swerve distance
15 she traveled during that speed.

16 Q. What speed did you put into that equation
17 when calculating her max swerve?

18 A. 90 miles per hour.

19 Q. Okay. Did you test that equation at the
20 lower speed, right, that didn't mean closer to 87 miles
21 an hour?

22 A. I didn't, no. It would increase it by a
23 tenth of a degree.

24 Q. Okay. Which would -- would that change your
25 conclusion at all?



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1 A. No. Again, we're rounding to the nearest
2 degree, so a tenth of a degree is just too precise to
3 make any opinions from.

4 Q. Okay. So do you know how many feet behind
5 the Toyota Nehemias was standing?

6 A. I certainly modeled it at a given distance,
7 but the testimony seems to indicate within arm's reach.
8 Pretty close.

9 Q. Okay. So does the physical evidence give you
10 any basis to conclude how far back from the Toyota he was
11 standing? Not lateral; let's just set lateral to the
12 side. But just how far back from the trunk?

13 A. No. There's really no -- let me rephrase
14 that. Within 10 feet, yes.

15 Q. Okay.

16 A. But we can't really get any more precise --

17 Q. Yeah.

18 A. -- than that.

19 Q. You know he's not 50 feet back?

20 A. Right.

21 Q. And you know -- I mean, would you say you
22 know he's not, like, 1 foot away from the trunk?

23 A. I would say it's possible, but I don't know.
24 5 feet seems reasonable. So I don't have a specific
25 answer for you. But I know it wasn't 30; I know it



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1 wasn't 40; I know it wasn't 250 feet, which is the
2 distance that she would have had to start her swerve from
3 on the shoulder. So for what it's worth, when the
4 witnesses said they saw her driving on the shoulder, they
5 would have had to have seen her driving 250 feet away at
6 that point.

7 Q. Okay. All right. So on Page 12, you
8 describe in detail the steps needed to remove the Camry's
9 spare tire?

10 A. Yes.

11 Q. Okay. So do you believe that most of these
12 steps had been concluded by the time the collision
13 occurred?

14 A. There's certainly conflicting testimony about
15 what step they were on. I know there was some testimony
16 about either the spare tire was in the process of being
17 picked up out of the trunk, or it was already out of the
18 trunk. The jack, obviously, with the jack arm was
19 already out of the trunk and underneath the car, and they
20 went looking for the -- the tool to take the lug nuts
21 off.

22 Q. And do you make any conclusions based upon
23 the status of the tire change other than the jack stand?

24 A. No. I think I just wanted to understand the
25 configuration of the spare tire a little bit better --



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1 Q. Okay.

2 A. -- to help understand or at least educate the
3 jury, you know, where the parts are supposed to be, maybe
4 what step they were on, just helping the jury understand.

5 Q. Okay. But you don't know which step they
6 were on, based on the physical evidence you reviewed?

7 A. Well, I know the tire was out after the
8 incident, and I know the jack and the crank was out. So
9 it can certainly help the jury at least know that that
10 was taken out.

11 Q. Okay. So what other steps remain if the
12 tire -- if the jack's set and the tire is out of the back
13 of the car, what part remains?

14 A. The only other step that would be next would
15 be to start taking off the lug nuts, which the tool for
16 the lug nuts should have been with the jack and the
17 crank.

18 Q. Okay. Do you have any opinion about where
19 the tool to remove the lug nuts -- now, are we talking
20 about that tire iron, or are we talking about something
21 different?

22 A. Yeah, just the standard stock tire iron tool
23 to take off lug nuts.

24 Q. Okay. Are there any other tools that you're
25 aware of that were needed?



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1 A. No.

2 Q. Okay. Do you believe that Nehemias was doing
3 something unrelated to changing the tire when he was
4 struck by Caylee Smith?

5 A. I don't -- I can't answer that.

6 Q. Okay. So you don't know what he was doing?

7 A. No.

8 Q. Okay.

9 A. Other than bending over.

10 Q. Which is based on your analysis --

11 A. Yes.

12 Q. -- right? Okay.

13 A. Mm-hmm.

14 Q. So how did you take into account
15 Caylee Smith's testimony at her deposition that
16 Nehemias Santos stepped out in front of the Ford Explorer
17 at the last minute?

18 A. Well, remember, I'm performing an objective
19 analysis and comparing it to the testimony. If I would
20 just simply recite testimony, then what good am I? So
21 I'm using science and objective evidence to figure out
22 what I can determine based on that, and then we can make
23 comparisons.

24 So it is what it is. It's just direct
25 comparison. Caylee had mentioned something about bending



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1 over, stepping out. I think it's just a game of
2 semantics at that point. But what I can say is the
3 evidence shows that he was bending over.

4 Q. Okay. What did you -- how do you take into
5 account Caylee Smith's deposition testimony at her
6 deposition that Nehemias Santos was facing the Toyota,
7 like, the side of the Toyota when she hit him?

8 A. I don't remember that testimony.

9 Q. Okay. Do you remember her testifying that it
10 was her belief that he's standing in the roadway looking
11 at the back right passenger tire?

12 A. I didn't interpret it that way. I understood
13 it to be that he was at the back right tire or near the
14 back right tire. I don't recall there being enough
15 detail in the testimony to say exactly what he's looking
16 at. What I will say is this all happened rather quickly,
17 and there were various versions of what she thought she
18 saw. Again, I'm just reciting what the testimony says.
19 That has no bearing on my analysis. I'm relying on the
20 objective evidence and data. I present that to the jury,
21 and they can do with it what they want.

22 Q. So did you take into account Caylee Smith's
23 written statement to the police where she said that
24 Nehemias was kneeling down to change a tire?

25 A. So again, you keep using the word "take into



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1 account." I'm relying on objective evidence. So it's
2 not that I'm dismissing or using specific points of
3 testimony. I'm doing my own independent analysis, and I
4 read the testimony. So I'm not necessarily relying on
5 the testimony here. So you're welcome to make a
6 comparison to the jury, but that has no relevancy to what
7 I've done.

8 Q. But based on your analysis, you do not
9 believe it's true that Nehemias Santos was looking at
10 the -- standing in the roadway looking at the back right
11 tire of the Toyota, right?

12 A. At least not at the point of impact.
13 Certainly, he could be doing a multitude of things
14 leading up to impact or within a half second or second
15 before impact, which, quite frankly, is when Ms. Caylee
16 would see him. She's not going to see his head at
17 impact; the hood is blocking her view of his head. So I
18 wouldn't expect her to know his exact orientation at
19 impact. She can't see that.

20 Q. Okay. Now, on Page 14 of your report, you
21 say that, "Therefore, had the Ford driver swerved a foot
22 further to the right, the collision would have been
23 avoided. However, it was indeterminate as to how much
24 advanced notice Ms. Smith was provided of
25 Mr. Nehemias Roderico Pivaral Santos actively bending

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1 over into her path."

2 A. Correct.

3 Q. So you modeled out the maximum swerve that
4 she could do at 90 miles an hour, right?

5 A. What do you mean, the maximum swerve she
6 could do?

7 Q. Well, you testified earlier that you -- you
8 have an equation that shows that she can only make a
9 rightward emergency swerve of 3.1 degrees when she's
10 traveling at 90 miles an hour, right?

11 A. Yes, given -- yeah, given the lateral
12 movement, yes.

13 Q. Okay. So if she'd been going slower, she
14 would have been able to make a greater swerve to the
15 right, correct, mathematically?

16 A. I suppose I can agree with that.

17 Q. Okay. So --

18 A. Again, we're talking a tenth of a degree, so
19 qualitatively, I think I can agree with you.

20 Q. Well, I'm not telling you how much slower she
21 could have been. If she'd been going the speed limit,
22 right, then it would have been an even greater ability to
23 make a turn to the right?

24 A. Maybe two-tenths of a degree, because we saw
25 that 10-mile-per-hour difference with a tenth of a



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1 degree.

2 Q. Okay. I mean, it's quadratic, right? So it
3 might be different if -- you know, exponentially, right?

4 A. Well, all I'm saying is when you
5 hypothetically asked me the question before, I changed
6 the input from 90 to 80, and it changed the orientation
7 by one-tenth of a degree.

8 Q. So if you change it to 75, how many tenths of
9 a degree does it change it?

10 A. I can certainly do that. .35 degrees.

11 Q. Okay. So if she'd been going the speed
12 limit, she'd have been able to increase her turn to,
13 what, three point -- let's call it 3.5 degrees?

14 A. 3.45.

15 Q. 3.45, okay.

16 And if she'd been going the speed limit and
17 then decreased her speed more, obviously, she'd have been
18 able to turn even more, right?

19 A. Maybe.

20 Q. Okay. I mean, mathematically, yes, right?

21 A. Yes.

22 Q. Okay. Do you believe that if Caylee had not
23 been texting Gracie, she would have seen the Camry sooner
24 than she did?

25 A. I can't say that.



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1 Q. Why not?

2 A. I don't know what traffic conditions were
3 like; I don't know when she was presented the visual
4 sight line to the Camry. What I do know is that she
5 responded to the Camry successfully.

6 Q. Two seconds before?

7 A. Whenever she did, she responded like the
8 average driver does to a roadside parked vehicle with a
9 pedestrian --

10 Q. Well, when --

11 A. -- so she successfully responded to the
12 Camry. The issue was the secondary imminent hazard that
13 presented itself with Mr. Nehemias bending over.

14 Q. But she didn't reduce her speed until two
15 seconds before she passed the Camry, right?

16 A. She reduced her speed by 4 miles per hour,
17 which is --

18 Q. Two seconds before?

19 A. Right, which is greater than what the average
20 driver does.

21 CONTINUED IN VOLUME II

22 * * * * *

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1 IN THE UNITED STATES DISTRICT COURT FOR THE
2 NORTHERN DISTRICT OF TEXAS

3 Civil Action No. 3:22-CV-02714-K

4 ERICK RODERICO PIVARAL
5 GONZALEZ, Individually and as Special
6 Administrator of the Estate of
7 NEHEMIAS R. PIVARAL SANTOS,
8 DECEASED, ERICK SANTOS, and
9 EVELYN MORENO,

ORIGINAL

10 Plaintiffs,

11 vs.

12 CAYLEE ERIN SMITH &
13 EASTMAN CHEMICAL COMPANY,

14 Defendants.

15 _____/

16 VOLUME II

17 DEPOSITION OF: PAUL J. MONTALBANO

18 DATE TAKEN: Tuesday, December 19, 2023

19 TIME: 3:01 p.m.

20 PLACE: Wingate by Wyndham
21 5750 Hazeltine National Drive
22 Orlando, Florida 32822

23 TAKEN BY: Plaintiffs

24 REPORTED BY: Jennifer Prohaska
25 Court Reporter and Notary Public

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TAMPA, FL 33602

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- - - - -
S T I P U L A T I O N S

It is hereby stipulated by and between counsel for
the respective parties that the reading and signing of
the deposition be reserved.



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* * * * *

(CONTINUED FROM VOLUME I)

BY MR. WHITE:

Q. Okay. Do you agree that, when going over 85 miles an hour, it's needlessly dangerous to text and drive?

A. Yeah, you are asking jury questions. I can't answer those.

Q. You don't have an opinion on whether or not it's needlessly dangerous to text and drive going over 85 miles an hour?

A. "Needlessly dangerous" is such a subjective term. I'm here to analyze the objective science. You're welcome to present these words on closing. That is not my job.

Q. I'm just asking, you know, you're an accident reconstructionist and you do this for a living, right?

A. Yes.

Q. Do you think it's dangerous to text and drive?

A. It depends.

Q. Okay. Do you think it's dangerous to text and drive when you're going over 85 miles an hour?

A. It just -- it all depends. You've got to analyze every case.



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1 Q. So it might not always be dangerous to text
2 and drive when going over 85 miles an hour?

3 A. It might not.

4 Q. Okay. You think it's wrong to text and drive
5 when you're going over 85 miles an hour?

6 A. You're asking jury questions. I can't answer
7 that.

8 Q. You don't have an opinion?

9 A. No. I'm here to apply accident
10 reconstruction analysis. I can't -- I'm not here to say
11 what's right and wrong. That's a jury question. I can't
12 invade the province of the jury.

13 Q. So you just don't have -- you don't have an
14 opinion about it?

15 A. I'm not allowed to give layperson opinions.
16 Experts have been stricken for that, so I'm going to stay
17 in my lane. I'm giving you the science. You're welcome
18 to, again, make your attorney arguments. I can't bolster
19 your attorney arguments.

20 Q. So we go to Figure 89 on Page 64. Can you
21 take that red pen on page -- on Figure 89 and draw where
22 you think Nehemias Santos was standing?

23 MR. DUBOFF: Object as vague.

24 A. Oh, my goodness, no, I can't do this.

25 Q. No, no, sorry. Figure 89.



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App. 000353

1 A. Oh, Figure 89. No, I can't do this. I have
2 a diagram that shows you this. I can't replicate a view
3 with a pen. I've already done this graphically.

4 Q. So when you say you made a diagram, you're
5 talking about Figures 119 and 120?

6 A. Yeah. Again, if you recall, I'm not telling
7 the jury where he was. I'm presenting the two provided
8 versions.

9 Q. I mean, I think you provided some opinions
10 about where -- where he wasn't standing, right? But you
11 don't have an opinion on where he was standing?

12 A. It's a range, remember? So we have one end
13 of the range is the plaintiff version, the other end of
14 the range is the defendant version. So I'm offering
15 those two versions.

16 Q. But you've concluded one is consistent with
17 the evidence and one is not, right?

18 A. What evidence? What do you mean?

19 Q. You've concluded that the defense version of
20 events is consistent with the evidence, correct?

21 A. Well, with his final rest, yes. Because he
22 bounces off the Toyota and then back to the Ford so -- in
23 Plaintiffs' version, the Ford is physically occupying his
24 original final rest. Since we know he hits the Ford, he
25 can't occupy the same space at the same time.



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1 Q. Okay. So you don't have an opinion as to
2 where he was standing when he was struck by the Ford
3 Explorer?

4 A. I don't have a specific opinion. I do have a
5 range that I'm presenting.

6 Q. Okay. Describe the range for us.

7 A. The range is anywhere between -- anywhere
8 between 3.2 feet into the travel lane up to about -- I
9 think that's 6. Let me double-check. 5, I'm sorry.
10 5 feet to the travel lane. So anywhere between 3 and 5
11 feet.

12 Q. In the travel lane or outboard of the Toyota?

13 A. Into the travel lane.

14 Q. Okay. And -- but you don't have an opinion
15 about how far back he was from the Toyota?

16 A. I modeled him a couple feet. But again, you
17 know, plus or minus 5 feet. There's no reason to take a
18 hard stance on that, because it doesn't affect any of the
19 analysis.

20 Q. Okay.

21 A. Certainly, if it was 250 feet, that would
22 affect things. But that variable is not that sensitive.

23 Q. But then, so if I ask you to draw an X marks
24 the dot where Nehemias Santos was standing when he was
25 struck by Caylee Smith, you cannot draw that X?



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1 A. Well, remember, I'm giving you a range, so I
2 would have to draw a series of X's --

3 Q. Right, right.

4 A. -- within that range.

5 Q. But you can't -- but you can't draw one X and
6 say that's where he was standing?

7 A. No, no. I'm giving you a range, so I
8 can't -- I can't establish a range with one point.

9 Q. Okay. So if you go to Figure 121 on Page
10 180 -- let me know when you're there.

11 A. Okay.

12 Q. All right. So you see where you've got an
13 arrow pointing to his body, it says "initial rest"?

14 A. Yes.

15 Q. Okay. So how did you conclude that his feet
16 were in the middle lane as opposed to his feet being
17 pointed towards the Toyota?

18 A. Yeah, that certainly has room for -- oops --
19 that is not drawn specifically. What the evidence shows
20 is that he was dragged.

21 Q. So your opinion is his head was at the point
22 where y'all drew the head on Figure 121, right?

23 A. In his initial rest?

24 Q. In his initial rest, yes.

25 A. That seems to be where the blood is coming



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1 from, so it just makes the most sense, especially with
2 him being dragged backward towards the shoulder. It's
3 just what made the most sense.

4 Q. But you don't have an opinion about which
5 direction his legs were facing, either towards the Toyota
6 or towards the middle lane?

7 A. No. And I indicated that in the report. I
8 don't have a specific final rest, or I should say initial
9 rest of him. I just know it was on the initial path of
10 the travel lane.

11 Q. So if Figure 121 was replicated, but with his
12 head where it is in the initial rest position, but his
13 feet pointing towards the Toyota, you wouldn't have any
14 problem with that?

15 A. No.

16 MR. WHITE: Okay. All right. I reserve the
17 rest of my questions for trial.

18 MR. DUBOFF: Okay. Let me just -- I just
19 have a couple.

20 CROSS-EXAMINATION

21 BY MR. DUBOFF:

22 Q. I think that this might have just been a word
23 mix-up, but, Mr. Montalbano, correct me if I'm wrong.
24 This was earlier in your testimony. But do you recall
25 Mr. White asking you questions about how average drivers



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App. 000357

1 have responded to roadside obstacles?

2 A. I think so.

3 Q. And I think there was a phrasing for a few of
4 the questions that was something like, "So people slow
5 down a few miles per hour before they hit a pedestrian."
6 Can you just -- are those studies that you were
7 referencing, were those about pedestrian strikes or about
8 roadside obstacles or both?

9 A. Oh, I -- did I say "before hitting the
10 pedestrian"?

11 Q. I think the question was phrased in that way.

12 A. Oh, yes. So these were roadside hazards that
13 weren't imminent hazards. It was determining what
14 drivers did in response to the presence of a potential
15 hazard. And the studies show that drivers typically will
16 slow down 1 to 3 miles per hour for a roadside hazard
17 prior to crossing that roadside hazard, so prior to
18 arriving at the roadside hazard.

19 Q. Okay. And so those studies were not about
20 how far before hitting a pedestrian people brake?

21 A. No, those were not imminent hazard studies.
22 Those were potential hazard studies, which is what we
23 have in this particular case.

24 Q. With regard to -- if you could turn to
25 Page 61 of your report in Figure 83.



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1 A. Okay.

2 Q. And this is going back to the questions that
3 you were asked about whether one of those tire marks was
4 made by somebody driving through that fluid. Is it your
5 understanding that those photos were taken when
6 Mr. Santos was at his final point of rest?

7 A. Yes.

8 Q. And in the course of your analysis, did you
9 review all of the body camera and dash camera video that
10 was available?

11 A. Yes.

12 Q. During any of that video, did you see a
13 car -- well, let me back up.

14 No one -- a car could not have made those
15 tire marks driving through the fluid when Mr. Santos was
16 at his initial point of rest without driving over
17 Mr. Santos, correct?

18 A. Yeah, I would agree with that. In particular
19 in this picture, we see some brain matter also in line
20 with that tire track, so I would imagine the brain matter
21 would have been flattened in conjunction with driving
22 over the fluid if this was post impact.

23 Q. And so for -- for a tire to have driven
24 through the fluid, it would have had to have been after
25 Mr. Santos's body was dragged onto the shoulder, correct?



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1 A. Right.

2 Q. Did you see anything in any of the video that
3 you reviewed that would indicate that a vehicle did drive
4 through the fluid?

5 A. No.

6 Q. And did that -- does that contribute in any
7 way to your opinion that those are actual tire marks from
8 an -- from an emergency maneuver as opposed to driving
9 through fluid?

10 A. Yeah. I mean, I think it goes back to the
11 consistency of the curvature of the marks, and the
12 characteristics of the marks tell me that it has all of
13 the classic details of a swerving maneuver versus
14 traveling through some fluid. And then, obviously, when
15 you factor in the other components that would have had to
16 have been driven over if that was a post impact, I think
17 that certainly compounds [sic] to my interpretation of
18 the characteristics of those marks as swerving marks
19 prior to.

20 Q. With regard to the questions about GPS
21 precision, just to try to maybe put it in simpler terms,
22 I suppose it's true that every point on the Earth has a
23 true GPS location?

24 A. Yes.

25 Q. Okay. And so when we're talking about --



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1 when you use the phrase "global accuracy," tell me if
2 this is what you mean by that. If I were to go out to a
3 point in the middle of the woods, get my true GPS
4 location, and, like, plant a flag there, would accuracy
5 be the ability of a GPS device to locate that exact spot?

6 A. Yes.

7 Q. Okay. And that -- that has a certain
8 tolerance or error factor to it?

9 A. Right.

10 Q. Okay. When you were speaking about
11 relativity and things of that nature, am I understanding
12 correctly that wherever Ms. Smith was on the globe, you
13 would expect the GPS data to pick up if, from one second
14 to another, she was moving east or west or north or
15 south?

16 A. Yeah. When you're in the same environment,
17 when you take that sample of your GPS data into very
18 small increments -- where we're not talking differences
19 between having 24 satellites in your reception versus 22
20 satellites -- a couple miles away, either due to the
21 position of the satellites and the differential distance
22 on the Earth, you're talking about a very small subsample
23 where all the points in that subsample are going to have
24 the same satellite numbers. It's going to have the same
25 signal, or reception, you can say, to those satellites.



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1 The things that really affect GPS signal is,
2 again, number of satellites that you have available to
3 you depending on the constellations, what path they're
4 in, the reception to those satellites: Are there
5 buildings or trees obstructing the reception or
6 interfering with the reception where the signal could
7 bounce off of objects and cause some errors? Those are
8 really the big factors that affect your accuracy.

9 So when you take a small subsample that has
10 the same environment and variables that go into accuracy,
11 the accuracy is the same on every subsample. And so any
12 deviation between subsamples is going to be accurate. I
13 like to call it the theory of relativity.

14 Q. Under -- understood.

15 You used a phrase towards the end, and I just
16 want to make sure we're clear on that. Towards the end
17 of your testimony, you spoke about comparing Plaintiffs'
18 version of events to the defense version of events; is
19 that right?

20 A. Right.

21 Q. And just so we're clear, when you use those
22 terms, the defendants' version of events is Ms. Smith is
23 driving sort of as far right in the left lane as she can
24 without intruding into the middle lane?

25 A. Correct. Like, she scooted over in the right



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App. 000362

1 lane, similar to what the human factor studies show
2 drivers do in response to a roadside potential hazard
3 like a vehicle with a pedestrian.

4 Q. And you understood from Ms. Moreno's
5 statements to police at the scene where she said that
6 Mr. Santos never went further into the lane than the
7 Camry, correct?

8 A. Correct. I think she was confused at how it
9 happened, since she didn't see him go into the lane.

10 Q. Is it fair to say that the range of values
11 that you calculated were sort of based on what the
12 evidence shows the minimum and maximum distances that
13 Mr. Santos could have been laterally in the left lane?

14 A. It was a fully encompassing range accounting
15 for both versions. At the end of the day, it's -- it
16 is -- there's no smoking gun evidence to tell us where
17 within that range this happened. What I can say is the
18 range closer to Defendants' version does make more sense
19 based on Mr. Nehemias's final rest versus Plaintiffs'
20 version.

21 But what I can objectively say is these are
22 the two versions that were provided to me. When you
23 factor in the overlap established from the damage
24 matching, this is the range that it lies within. I'll
25 let the jury decide what side of the range or what end of



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App. 000363

1 the range or whether they want to pick the middle of the
2 range where they think he was standing, but it's going to
3 be somewhere in that range, based on what I've been
4 provided.

5 Q. And just -- can you explain what you mean by
6 "Plaintiffs' version of events"?

7 A. Plaintiffs' version was that she, being
8 Caylee, drove onto the shoulder and made an emergency
9 swerve from the shoulder to her right, striking
10 Mr. Nehemias, which we know she didn't strike the Toyota,
11 and we know the vehicle dynamic properties of an
12 emergency swerve. And that emergency swerve would have
13 had to start 250 feet away in order for her to displace
14 herself laterally from the shoulder and not strike the
15 Toyota.

16 And so I think that number is valuable to the
17 jury, because when they're listening about the testimony
18 of these witnesses that observed her on the shoulder, my
19 understanding was they looked up at impact. And I did
20 not hear anybody testify that she was 250 feet away when
21 she was on the shoulder, because it's physically
22 impossible for her to exist on the shoulder any closer
23 than 250 feet away, because she cannot get out of the way
24 in time or she would have ran into the Toyota, and we
25 know she did not run into the Toyota.

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App. 000364

1 So I know on a vehicle dynamics standpoint,
2 she cannot exist on the shoulder any closer than
3 250 feet. So if she ever did exist on the shoulder, it
4 was beyond 250 feet away, and again, we don't have any
5 corroborative digital evidence to indicate that based on
6 her GPS coordinates and her bearing data.

7 Q. And I think just to clarify, there have been
8 several versions from Plaintiffs or witnesses on the
9 Plaintiffs' side, one of which is that she actually hit
10 Mr. Santos when he was standing fully on the shoulder?

11 A. Right, which is physically impossible.

12 Q. Okay. So that's not included in your range
13 of his possible locations, correct?

14 A. Not at all. That was physically impossible.

15 Q. Okay. So when you say you took into account
16 Plaintiffs' version, you had to in some way align
17 Plaintiffs' version with what would be physically
18 possible?

19 A. Right. What I did was I took the testimony
20 that she was on the shoulder and aligned it with the fact
21 that she did not hit the Toyota and tried to give them
22 the Plaintiffs' version as much as I could.

23 MR. DUBOFF: Okay. Those are all the
24 questions that I have.

25 MR. WHITE: Reserve the remainder for trial.



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App. 000365

1 THE VIDEOGRAPHER: Two questions before we go
2 off: Would you like the video, to order the video
3 at this time?

4 MR. WHITE: Yes, please.

5 THE VIDEOGRAPHER: Would you like it synced
6 with the transcript?

7 MR. WHITE: Yes.

8 THE VIDEOGRAPHER: Would you?

9 MR. DUBOFF: Yes, ma'am.

10 THE VIDEOGRAPHER: The time is 3:19 p.m., and
11 we are off record.

12 THE REPORTER: So you're ordering the
13 original; standard turnaround time?

14 MR. WHITE: Yes, ma'am.

15 (The deposition was concluded at 3:19 p.m.)
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App. 000366

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CERTIFICATE OF OATH

STATE OF FLORIDA:
COUNTY OF ORANGE:

I, Jennifer Prohaska, Stenograph Shorthand Reporter, certify that PAUL J. MONTALBANO personally appeared before me and was duly sworn.

WITNESS my hand and official seal this 19th day of December, 2023.

Jennifer Prohaska

Jennifer Prohaska
Notary Public - State of Florida
My commission No.: GG987188

CERTIFICATE OF REPORTER

STATE OF FLORIDA:
COUNTY OF ORANGE:

I, Jennifer Prohaska, Stenograph Shorthand Reporter, certify that I was authorized to and did stenographically report the foregoing deposition of PAUL J. MONTALBANO; that the review of the transcript was requested; and that the foregoing Pages 4 through 217, inclusive, are a true and complete record of my stenograph notes.

I further certify that I am not a relative or employee of any of the parties, nor am I a relative or counsel connected with the parties' attorneys or counsel connected with the action, nor am I financially interested in the outcome of the action.

DATED this 2nd day of January, 2024.

Jennifer Prohaska

Jennifer Prohaska,
Stenograph Shorthand Reporter



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App. 000367

1	ERRATA SHEET			
2	DO NOT WRITE ON TRANSCRIPT - ENTER CHANGES			
3	IN RE:	Erick Roderico Pivaral Gonzalez,		
4		Individually and as Special		
5		Administrator of the Estate of		
6		Nehemias R. Pivaral Santos, Deceased,		
7		Erick Santos, and Evelyn Moreno vs.		
8		Caylee Erin Smith & Eastman Chemical		
9		Company		
10	CASE NO.:	3:22-CV-02714-K		
11	DATE:	December 19, 2023		
12	DEPONENT:	PAUL J. MONTALBANO		
13	PAGE #	LINE #	CORRECTION	REASON
14	-----	-----	-----	-----
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22	Under penalties of perjury, I have read my			
23	deposition in this matter and that it is true and			
24	correct, subject to any changes in form or substance as			
25	reflected above.			
	Dated: _____	Signed: _____		



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January 04, 2024

Paul J. Montalbano

RE: Deposition of **Paul J. Montalbano** taken on 12/19/2023
Erick Roderico Pivaral Gonzalez v. Smith & Eastman Chemical Company

Dear ,

IMPORTANT NOTICE FOR DEPOSITION TRANSCRIPT READ AND SIGN

It is suggested that the review of this transcript be completed within 30 days of your receipt of this letter, as considered reasonable under Federal Rules*.

 X **Attorney - Copy of Transcript Enclosed:** Signature of the Deponent is required. Please have the deponent make any corrections/changes necessary on the Errata Sheet ONLY, sign name on the form where indicated. Please return ONLY the original signed Errata Sheet to our offices within 30 days from the date of this memorandum. If you have any questions, please call our offices.

 Attorney - No Copy Ordered: Since you did not request a copy of the transcript, it will be necessary for the Deponent to call our offices to arrange for an appointment to read and sign the transcript of the Deposition within 30 days of this memorandum.

 Deponent: At the time of your deposition, you did not waive your right to read and sign the transcript of your testimony, therefore, attached please find a copy of the transcript and Errata Sheet. Please read the transcript, make any corrections necessary on the Errata Sheet ONLY, sign the bottom of the Errata Sheet, and return it within 30 days from the date of this memorandum. Please call our offices if you have any questions.

 Deponent: At the time of your deposition, you did not waive your right to read and sign the transcript of your testimony, therefore, it is necessary for you to come to our offices to read and sign same. Please call Milestone Reporting Company to arrange for an appointment at your earliest convenience.

 The attached executed copies of the Errata Sheet(s) are sent to you for your files. If you have any questions, please call our offices.

Thank you for your attention to this matter.

No. 300977

cc:

Waiver:

I, Paul J. Montalbano, hereby waive the reading and signing of my deposition transcript.

Deponent Signature

Date

*Federal Civil Procedure Rule 30 (e) / Florida Civil Procedure Rule 1.310 (e)

EXHIBIT C



Figure 70: Ford damage.

EXHIBIT D

ORIGINAL
TRANSCRIPT

UNITED STATES DISTRICT COURT
FOR THE
NORTHERN DISTRICT OF TEXAS

Erick Roderico Privaral)	
Gonzalez, et al.)	
)	
Plaintiff,)	Civil Action No.:
v.)	3:22-CV-02714-K
)	
)	
Caylee Erin Smith &)	
Eastman Chemical Company,)	
)	
Defendant.)	
_____)	

DATE: December 14, 2023
Kingston, New York
TIME: 11:31 a.m.-1:33 p.m.

Jaiden Hernandez, Reporter

DEPOSITION
OF
IRIS DALLEY GRAFF
(Appearing on behalf of the Defendants)

1 APPEARANCES:

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STIPULATIONS

IT IS HEREBY STIPULATED AND AGREED by and between the attorneys for the respective parties hereto, that the sealing and filing of the witness' deposition are hereby waived.

IT IS FURTHER STIPULATED AND AGREED by and between the attorneys for the respective parties hereto that all objections, except as to the form of the question, are reserved to the time of trial.

IT IS FURTHER STIPULATED AND AGREED by and between the attorneys for the respective parties hereto that they may sign this deposition before any duly qualified Notary Public.

* * * * *

1 Dalley Graff

2 * * * * *

3 Iris Dalley Graff, a appearing on behalf of the
4 Defendants herein, having been first duly sworn
5 by a Notary Public within and for the State of
6 New York, was examined and testified as follows:

7 * * * * *

8 MR. WHITE: This is Jacob White,
9 counsel for plaintiff Nehemias Santos, the
10 Estate of Nehemias Santos, his father Erick
11 Gonzalez, his brother Erick Santos, and Evelyn
12 Moreno.

13 We're here for a deposition on
14 December 14, 2023. We're starting at
15 approximately 11:32 a.m. Eastern Time, and I
16 understand we've got a 1:00 p.m. hard stop; is
17 that correct?

18 MR. BUNT: Yes.

19 MR. WHITE: And in the room with us
20 are Brian Bunt, counsel for --

21 MR. BUNT: I'll just -- I'm Brian
22 Bunt, counsel for Defendants Eastman Chemical
23 Company and Caylee Erin Smith. Also present
24 is my paralegal Stacy Bunt.

25 And I'm just going to state for

1 Dalley Graff

2 purposes of the record, not throwing stones,
3 the deposition was scheduled to begin at 9:00
4 a.m., and so we're starting very late.

5 MR. WHITE: Correct. Correct. No
6 objection from me there.

7 Q All right could you, the deponent,
8 state your name for the record.

9 A Iris Dalley Graff.

10 Q And are you a Dr. Graff? I just want
11 to make sure I address you correctly. Is
12 Ms. Graff, Mrs. Graff or Iris, or what do you
13 prefer?

14 A I'm not a doctor.

15 Q Okay. Is it okay if I call you Iris,
16 or do you prefer Mrs. Graff?

17 A Iris is fine.

18 Q Okay. Perfect, perfect. I take it
19 you've been deposed before.

20 A I have.

21 Q Okay. So there's normally an initial
22 litany of statements and agreements I would read
23 for you, but in the -- due to the exigencies of
24 time, I'm going to not do most of those. But I do
25 want to ask that you agree that if I ask you a

1 Dalley Graff

2 question and you answer it, you agree that means
3 that you understand the question. Do you agree
4 with that?

5 A Could you restate that, please?

6 Q Sure. If I ask you a question and you
7 answer it, can you agree that that means that you
8 understood the question?

9 A That I'll only answer questions that I
10 understand.

11 Q Okay. That's fine. That's perfect.
12 If you don't understand a question I ask, just let
13 me know; okay?

14 A Okay.

15 MR. WHITE: So let's introduce a
16 couple of exhibits. We'll mark these
17 as Exhibits 1, 2, and 3.

18 Let's mark your report in this case as
19 Plaintiff's Exhibit 1. You already have a
20 copy. Let's mark your CV as Plaintiff's
21 Exhibit 2. And the list of cases that you
22 have testified in in the past, I believe,
23 five years as Plaintiff's Exhibit 3.

24 (SCENE RECONSTRUCTION REPORT, BATES-STAMPED

25 00476.118002323 to 68 RECEIVED AND MARKED AS PLAINTIFF'S

Dalley Graff

EXHIBIT 1 FOR IDENTIFICATION.)

(CURRICULUM VITAE OF IRIS DALLEY GRAFF, BATES-STAMPED
00476.118002313 to 21 RECEIVED AND MARKED AS PLAINTIFF'S

EXHIBIT 2 FOR IDENTIFICATION.)

(SPREADSHEET OF CASES, BATES-STAMPED 00476.118002322
RECEIVED AND MARKED AS PLAINTIFF'S EXHIBIT 3 FOR
IDENTIFICATION.)

BY MR. WHITE:

Q Do you recognize these exhibits?

A I -- I recognize what appears to be a
copy my CV, and I recognize what appears to be a
copy of my report with an attachment of separately
printed figures from the report.

Q Okay.

A I have not before seen the spreadsheet
listing these cases.

Q Well, take a look at that list of
cases. Does that appear to be correct and
complete?

A I do recall testifying in each of the
listed cases.

Q Have you testified in any other cases
that are not listed on this list since February of
2018?

1 Dalley Graff

2 A Not that I recall at the moment.

3 Q Okay. And just to confirm, all of
4 these are criminal matters that are listed on
5 Exhibit 3?

6 A There's one that I'm not certain if it
7 falls under a criminal or not.

8 Q And is that the row where -- in column
9 C, where it says it was a grand jury?

10 A Yes.

11 Q I take it Madison County vs Dreasjon
12 Reed, you were testifying in front of a grand jury;
13 is that right?

14 A Yes.

15 Q Okay. And just for the record, I
16 think that probably means it was leading to a
17 criminal indictment, but do you know otherwise?

18 A I know there was not a criminal
19 indictment.

20 Q There wasn't one issued in that case?

21 A That's correct.

22 Q Okay. Do you remember what your
23 testimony was in that case?

24 A Yes.

25 Q Can you describe it for me?

1 Dalley Graff

2 A It was an officer-involved shooting.

3 Q Okay. And were you testifying on --
4 did the prosecutor call you as a blood spatter or a
5 blood pattern analyst?

6 A I think I was actually contacted
7 originally by the Indiana State Police, but that
8 was -- I don't know if they were speaking on behalf
9 of the prosecutor. I don't know what their
10 relationship was.

11 Q Okay. So did any of these cases that
12 are listed here involve a pedestrian struck by an
13 automobile?

14 A No.

15 Q Okay. How many of the cases listed
16 here involved shootings with a firearm?

17 A Seven.

18 Q Okay. Which ones did not involve a
19 shooting with a fireman?

20 A US vs Tyler Mullins.

21 Q And what did that case involve?

22 A It was a death investigation.

23 Q Okay. How was the death caused to the
24 best of your knowledge?

25 A It was a multitude of injuries.

1 Dalley Graff

2 Q Do you know what the cause of those
3 injuries were?

4 A There was blunt force trauma. There
5 was exposure to carbon monoxide. There was
6 shooting. That was affixation.

7 Q So Tyler Mollins, that case did
8 involve the use of a firearm as a potential
9 contributing cause to death?

10 A I think it was. I don't recall if it
11 was listed as the primary cause of death, but it
12 would have been one of the primary causes.

13 Q Do you know what the causes of the
14 blunt force trauma were in that case?

15 A I don't know specifically. I know
16 generally what was presented as potential weapons.

17 Q Okay. And so can you summarize for us
18 your conclusions in that case? The Tyler Mollin's
19 case.

20 A The conclusions involved the
21 clandestine burial and acts that had to have
22 occurred prior to that clandestine burial and the
23 sequencing of those acts.

24 Q And did you -- so I see here that that
25 case is marked "Subject Matter, Crime Scene

1 Dalley Graff

2 Reconstruction." Did you not conduct a bloodstain
3 pattern analysis on the case?

4 A Bloodstain pattern analysis was a part
5 of the crime scene reconstruction.

6 Q Okay. And what were your conclusions
7 from your bloodstain pattern analysis in that case?

8 A In that case that the blunt force
9 trauma occurred at a different location and
10 involved a vehicle and the sequencing of events at
11 the gravesite.

12 Q So a vehicle was involved in that
13 case?

14 A Yes, it was.

15 Q Okay. Can you describe your
16 conclusions regarding how a vehicle was involved in
17 that case?

18 A That the victim was concealed and
19 contained within the trunk of the car while the car
20 was in motion, while the engine was running.

21 Q And how did you reach that conclusion?

22 A Carbon monoxide in her blood and
23 bloodstains inside the vehicle.

24 Q Okay. Now, are you an expert on
25 what's in someone's bloodstream, or are you just a

1 Dalley Graff

2 blood pattern analyst expert?

3 A I do crime scene reconstruction, which
4 means I can use the conclusions of other experts,
5 such as toxicologists issuing a report.

6 Q So in that case did you rely on a
7 toxicology report?

8 A I did.

9 Q Okay. Did you rely on a pathology
10 report or an autopsy in that case?

11 A I did.

12 Q How many of the cases listed here did
13 you rely on another technical expert's report, such
14 as a pathologist or a coroner or some other
15 forensic analyst?

16 A I'm sorry. I don't think it would be
17 correct to say that I relied on the report, but
18 they provided information that I used in
19 conjunction with my analysis.

20 Q Okay. So, but, for example, if you're
21 trying to figure out what's in someone's
22 bloodstream, you have got to get that information
23 from a different forensic expert; correct?

24 A If it's a toxicology, then, yes, it
25 would have to be done by someone who does

1 Dalley Graff

2 toxicology or...

3 Q And why wouldn't it be done by you?

4 A I'm not a toxicologist.

5 Q Okay. Which means you can't run
6 toxicology reports, correct?

7 A That's correct.

8 Q All right. You can't conduct
9 autopsies, correct?

10 A I don't personally do the autopsies.
11 I have attended autopsies. I've provided
12 information to the person doing the autopsies, have
13 discussed results of the autopsies in context of
14 the scene in which it occurred, but I don't do the
15 autopsy itself.

16 Q And you can't sign an autopsy report,
17 right?

18 A That's correct. I don't sign an
19 autopsy report.

20 Q Okay. So in -- did -- you've already
21 testified that US vs Tyler Mullin's case did not
22 involve a shooting, right, as a primary cause of
23 death. Are there any other cases on there that
24 didn't involve shooting as a primary cause of
25 death?

1 Dalley Graff

2 A Okay. I think you misstated what I
3 said --

4 Q Okay.

5 A -- that, in fact, in the U.S. v. Tyler
6 Mollins, I believe that the autopsy did list
7 gunshot wound as a prime causes of death.

8 Q Okay.

9 A But these other injuries were also
10 involved in leading to the death.

11 Q Okay. So then I guess I misunderstood
12 earlier, because I thought you said US vs Tyler
13 Mullins did not involve a firearm shooting.

14 Are there any cases on this list
15 that's Exhibit 3 that do not involve a firearm or
16 an injury caused by a firearm?

17 A I'm sorry. I misstated earlier. I
18 believe they all involve some firearm at some
19 point.

20 Q Okay. Do any of these cases on
21 Exhibit 3 involve blunt force trauma caused by a
22 moving vehicle?

23 A Well, as I said in the US vs Tyler
24 Mullins case, there was blunt force trauma. And I
25 don't know the exact tools or implements that were

1 Dalley Graff

2 used. I don't have direct evidence that they were
3 caused by a moving vehicle.

4 Q Fair enough. But, again, my question
5 was: do any of these cases that are on Exhibit 3 --
6 to your knowledge, do any of them involve blunt
7 force trauma caused by a moving automobile?

8 A With the possible exception of the car
9 being used in the unidentified weapons of the blunt
10 force trauma in that one case, none of the others
11 that I know of involve moving vehicles at the time
12 of death.

13 Q So how many cases -- not just the ones
14 listed on Exhibit 3 -- how many cases have you
15 participated in an investigation of that have
16 involved blunt force trauma caused by a moving
17 vehicle?

18 A Several. I don't have a number.

19 Q Can you, I mean, give us your best
20 guess?

21 A I really don't have a number.

22 Q Is it less than a dozen? More than a
23 dozen?

24 A It would just be a guess that's around
25 a dozen, but that's just a guess.

1 Dalley Graff

2 Q So it could be less than a dozen? It
3 could be more than a dozen?

4 A Could be. I don't recall.

5 Q Okay. Do you remember the last time
6 when you investigated a case that involved blunt
7 force trauma caused by a vehicle?

8 A I do not remember the last one. The
9 last one before this one?

10 Q Sure.

11 A I only have this one at the present.

12 Q Okay.

13 A But I've been in a number over the
14 years.

15 Q Okay. Do you think, before this case,
16 the last one was in the last decade?

17 A I would say probably yes, but I don't
18 specifically recall one -- any one particular case
19 at the moment.

20 Q Okay. Have you ever dealt with a
21 case -- have you ever worked on a case involving a
22 pedestrian struck by a motor vehicle going over
23 70 miles an hour?

24 A Well, I have worked on cases that
25 involved pedestrians hit by a vehicle. I don't

1 Dalley Graff

2 know the speed.

3 Q Okay. Can you describe the cases
4 where you did work on -- strike that.

5 Can you describe cases that you worked
6 on that involved a pedestrian struck by a motor
7 vehicle?

8 A I'm sorry. You want -- could you
9 restate that question? I don't understand the
10 question.

11 Q Sure, sure. Can you describe the
12 facts in this cases that you have worked on that
13 involved a pedestrian struck by a motor vehicle?

14 A I -- couple of them come to mind. Of
15 course there's been a lot of cases over the years.
16 But one was a teenage girl walking on the road, and
17 a car struck her, and that was a hit-and-run.
18 There was a -- a young man walking on the side of
19 the road hit by a pickup. There have been several
20 where people were apparently laying on the roadway
21 and run over. There was an RV where a man said
22 that his wife got out to urinate behind the vehicle
23 and said he went to turn around and accidentally
24 ran over her. There was a case of an apparently
25 romantic relationship gone bad where he actually

1 Dalley Graff

2 said that he took her out there and ran over her
3 multiple times on a road.

4 Q So in any of the cases that you just
5 listed, did any of those cases involve someone
6 struck while -- strike that.

7 Did any of the cases that you just
8 listed involve an impact between a motor vehicle
9 and a pedestrian on an interstate highway?

10 A I don't recall the roadways.

11 Q Okay. So let's talk about the first
12 one that you mentioned, a hit-and-run. Do you
13 remember how you conducted your analysis in the
14 hit-and-run case where a teenage girl was involved
15 in a hit-and-run?

16 A Yes. I looked at, for one thing, the
17 car when it was found. And I examined the car to
18 determine, if possible, whether or not this was, in
19 fact, the same car because it was a hit-and-run.
20 But I would have also looked at the autopsy
21 results, the clothing worn by the victim, and those
22 kind of things.

23 Q So in that case did you physically --
24 like you in person examined the car that was
25 involved in the hit-and-run?

1 Dalley Graff

2 A I did.

3 Q Did you physically review the body, or
4 did you just review the autopsy afterwards?

5 A I don't recall if that was one of the
6 cases that I went to the autopsy or not.

7 Q Okay. Did any of the cases that you
8 told me about involving a pedestrian and a motor
9 vehicle, did you review the vehicle involved
10 physically in each one of those cases?

11 A Most of them I did, but without going
12 through case by case, I'd have to look at my notes
13 for exactly what I did in each case.

14 Q Okay. Did -- well, why -- is it
15 preferred to do a scene visit or to review the
16 evidence in person as a blood pattern analyst?

17 A It really depends on what the evidence
18 is. Sometimes that can be done from the
19 documentation done at the scene. Sometimes being
20 at the scene is helpful. It doesn't change what is
21 documented.

22 Q Okay. What sort of documentation
23 would allow you to conduct an investigation without
24 seeing the scene or the vehicle in person?

25 A What was the first part of your

1 Dalley Graff

2 question?

3 Q What sort of documentation would you
4 like to have in order for you to conclude that it's
5 not necessary for you to visit the scene or, for
6 example, see the vehicle in person?

7 A Well, in doing the analysis, I want to
8 see things like images, whether they're still
9 images or video-recorded images. If a sketch or
10 drawing is done by someone on the scene, then I
11 would want to see that. Any descriptions that are
12 given. Any reports -- especially official reports,
13 autopsy reports, or medical reports, if the person
14 is not dead. All of those things can contribute.
15 So the more information that I have, the more
16 detailed the reconstruction can be.

17 Q Okay. So when you're doing a blood
18 pattern analysis -- and am I saying that correctly?
19 I know there's different phraseology. Some people
20 call it blood spatter analysis. I take it you call
21 it bloodstain pattern analysis; is that right?

22 A It's bloodstain pattern analysis.

23 Q Okay. So when you're conducting a
24 bloodstain pattern analysis, are there any reports
25 or information that are necessarily required in

1 Dalley Graff

2 order for you to do your investigation without
3 visiting a scene or seeing evidence in person?

4 A The extent of the analysis -- and the
5 bloodstain pattern analysis is just one part of the
6 overall reconstruction. So the better the
7 documentation, the more specific, the more detailed
8 information that can be included in the
9 reconstruction. So the analysis is limited by the
10 availability of the evidence.

11 Q I guess what I'm asking is: is there a
12 minimum threshold at which if the evidence that you
13 have is not above that minimum threshold where you
14 cannot conduct a bloodstain pattern analysis?

15 A But in doing the bloodstain pattern
16 analysis, I will see what is available and, again,
17 that will determine how far the analysis will go.

18 If all I -- for example, if there's
19 only one bloodstain by itself, one bloodstain by
20 itself does not make a pattern and doesn't -- is
21 not alone something that can identify the action,
22 other than the fact that there was blood shed.

23 Q So how do you conclude that blood has
24 been shed from photographs?

25 A If the blood is outside of the body,

1 Dalley Graff

2 then there has to have been bloodshed, because the
3 blood is made inside the body.

4 Q Okay. So how do you know that what
5 you're looking at is blood?

6 A I do that based on my own education,
7 training, and experience and the number of years
8 that I actually attended scenes looking at blood.

9 Q Okay. So I want to ask you about
10 that. Can you summarize your education for us?

11 A My education is that I have a
12 bachelor's in science and biology. I have a
13 master's in secondary sciences. I have a --

14 Q Let's -- what is a master's in
15 secondary sciences?

16 A It's a graduate degree specifically
17 for teaching in the areas of science. And I
18 specifically taught in the physical sciences,
19 biology, general physical science, botany, anatomy,
20 physiology, all of that was included -- zoology.

21 Q Where did you teach those topics?

22 A I taught in primarily -- McAlester
23 High School was the longest. But I also taught as
24 an adjunct to local colleges.

25 Q Which local colleges did you teach at?

1 Dalley Graff

2 A It would be -- I forgot the name of
3 the college. It's in Wilburton, Oklahoma.

4 Q Okay.

5 A As an adjunct there. I think I also
6 taught some for the East Central University of Ada.
7 It's been a number of years ago.

8 Q But you said primarily you taught
9 these science topic at McAlester High School?

10 A Correct. Yeah. I taught -- the first
11 year I taught math, and then I taught general
12 physical science. And I taught physics one year
13 and then advanced placement biology, which was a
14 course where they could get more the credit than in
15 the other science courses.

16 Q And which grades did you teach in
17 McAlester High School?

18 A 9 through 12. But primarily the high
19 school juniors and seniors for the most part.

20 Q And how long did you teach at
21 McAlester High School?

22 A It was eight or nine years. I don't
23 recall exactly.

24 Q Do you remember just -- and it's not a
25 trick question but -- the time frame? Like, what

1 Dalley Graff

2 years to which years? It's okay if you don't know
3 exactly.

4 A I left that position in -- I think it
5 was '88.

6 Q So maybe approximately from '78 or --
7 excuse me. From 1980 to 1988?

8 A Approximately.

9 Q And what has your -- what's your
10 professional experience been since you taught at
11 McAlester High School?

12 A In 1989, I joined the Oklahoma State
13 Bureau of Investigation, and I attended thousands
14 of hours of training through my career; and I
15 worked primarily in forensic biology, forensic
16 zoology. And I also did crime scene investigation
17 throughout my career.

18 Q Okay. So do you have a degree in
19 engineering?

20 A No, I do not.

21 Q Okay. Do you have a degree in
22 physics?

23 A No, I do not.

24 Q Okay. What engineering training have
25 you received?

1 Dalley Graff

2 A I received some training in
3 engineering back when I was studying physics, but I
4 did not major or minor in engineering.

5 Q So you mean you took just maybe some
6 college classes on engineering?

7 A It was included in the physics
8 courses.

9 Q Okay. So did you study fluid dynamics
10 at any point in your professional training?

11 A Yes.

12 Q Do you have a degree in fluid
13 dynamics?

14 A No, I do not have a degree specific to
15 fluid dynamics.

16 Q Okay. Do you consider yourself an
17 expert in fluid dynamics?

18 A Only as it relates to bloodstains and
19 how bloodstains are formed.

20 Q Okay. So you have a particular
21 expertise in blood fluid dynamics. Do I understand
22 you correctly?

23 A I have some general training in fluid
24 dynamics, which I attended a workshop in 2016,
25 2017. I don't remember which year. It was

1 Dalley Graff

2 presented by Mark Germaine [proper noun subject to
3 change] from the University of Otago in the South
4 Island of New Zealand.

5 Q New Zealand is great.

6 A Yes. I did some teaching there myself
7 for a couple of years.

8 Q In Dunedin I take it?

9 A Yes, in Dunedin.

10 Q So is that the extent of your fluid
11 dynamics training is the workshop in New Zealand?

12 A No. The workshop actually was
13 presented at the gendarmerie headquarters just
14 outside Paris, France, but it was focused on fluid
15 dynamics and particularly as it relates to the
16 formation of bloodstain patterns.

17 Q Well, you said earlier you do have
18 some general training in fluid dynamics. I'm
19 trying to figure what's the extent of your
20 understanding of fluid dynamics separate from your
21 understanding with fluid dynamics with relation to
22 blood. So setting aside your understanding of
23 fluid dynamics with relation to blood, what is your
24 general understanding of fluid dynamics?

25 A Well, in terms of formal education,

1 Dalley Graff

2 there were units in fluid dynamics included in the
3 physics courses in college, and then I studied the
4 formation of bloodstains through various texts over
5 the years and doing my own experiments through the
6 years and then eventually attending Mark
7 Germanine's class.

8 Q How do you determine the viscosity of
9 a fluid?

10 A I haven't done this in a number of
11 years. I'm trying to remember the name of the
12 device. I worked for a couple years at a food
13 processing plant where I had to determine the
14 viscosity of several of the products there. I
15 remember doing it. You check specific gravity and
16 things like that. I don't recall now. I do recall
17 making reports about the viscosity of a number of
18 liquids.

19 Q So you have some experience
20 determining the viscosity of fluids, but I
21 understand your testimony is that you did that at a
22 food processing facility, and you had some machine
23 that helped you do that?

24 A I had various tools at the time. The
25 tools at the time were much more primitive than the

1 Dalley Graff

2 electronics that we use today.

3 Q Okay.

4 A But at that time, I did it on a daily
5 basis, and it would be very simple to -- to name
6 those implements, but that has been a number of
7 years ago.

8 Q Okay. So it's been some time since
9 you determined the viscosity of a fluid?

10 A Since I personally measured the
11 viscosity of a fluid has been a number of years.

12 Q Okay. Do you think you could
13 determine the viscosity of a fluid from a photo of
14 a fluid?

15 A It would depend on the fluid.

16 Q Can you?

17 A Well, there are certain types of
18 fluid, if you kind of know what it is, then you can
19 look it up. There are certain limits, and blood
20 would be an example.

21 Q But you would have to know what the
22 fluid was before you could determine the viscosity
23 from the photo, right?

24 A Well, I don't determine viscosity as
25 such from a photo, but I look at viscosity in terms

1 Dalley Graff

2 of the physical characteristics, as part of the
3 physical characteristics of blood that helps to
4 determine how the bloodstain patterns were formed.

5 Q But you would have to know it was
6 blood before you could determine the viscosity,
7 correct?

8 A I don't have to determine the
9 viscosity to see what the patterns are, but I use
10 the explanation of viscosity to help explain how
11 the patterns are formed.

12 Q So if you know it's blood, you
13 understand it's viscosity, and then you can
14 therefore determine the bloodstain pattern
15 analysis. Do I understand you correctly?

16 A No.

17 Q Okay. Please correct me.

18 A When we look at bloodstain patterns,
19 one of the considerations that helps to explain how
20 patterns are formed is the viscosity of blood. We
21 also know that blood has adhesive and cohesive
22 properties that help to explain how blood moves,
23 how blood collects, how bloodstain patterns are
24 actually formed. I don't need to know the numbers
25 to know this. Here's the physical effect.

1 Dalley Graff

2 Q Sure, sure. Because you already know
3 the viscosity of blood; right?

4 A We know how the viscosity of blood
5 effects the formation of the patterns. I don't
6 have to know the exact number.

7 Q Sure. I guess what I'm wondering is:
8 as a prerequisite to determining what you
9 understand from a bloodstain pattern, you have to
10 know you're looking at blood; right?

11 A If I'm looking at a pattern, I can
12 determine the pattern without knowing the
13 viscosity, and I can look at patterns and because
14 blood is a fluid, it acts as other fluids. So if
15 there is some other fluid with a similar viscosity,
16 it will form generally the same kinds of patterns.
17 I don't rely just on viscosity to determine whether
18 or not I think the fluid is blood.

19 Q So do you think all fluids have the
20 same viscosity?

21 A I know they are not.

22 Q Okay. So my question is: if you're
23 looking at a pattern, right, do you need to know
24 that it was caused by blood -- Excuse me. Sorry.
25 Strike that.

1 Dalley Graff

2 If you're looking at a pattern on a
3 photo, before you do the bloodstain pattern
4 analysis, you need to know you're looking at a
5 pattern created by blood, right?

6 A If I look at a photo of a pattern, I
7 can see that there's a pattern, period, full stop.
8 If you look at everything together, I can make
9 judgments about whether or not this looks to me
10 like blood based on my experience.

11 Q And if it wasn't blood, would your
12 pattern analysis be the same; or are you qualified
13 to do a pattern analysis on fluids that are not
14 blood?

15 A I could still describe what I see in a
16 pattern as far as identifying it's characteristics,
17 what's the shape of individual stains within a
18 pattern, what are the margins of that particular
19 shape, if there's a movement of fluid within that
20 shape, what that looks like. You could still
21 describe the pattern.

22 Q But can you derive conclusions from a
23 pattern of a fluid that is not blood?

24 A I'm not sure if I understand the
25 question.

1 Dalley Graff

2 Q So the purpose of bloodstain pattern
3 analysis is not just to identify patterns, right?

4 A The purpose of bloodstain pattern
5 analysis is to try to determine -- based on the
6 pattern that we see -- what movement of blood, what
7 potential causes, what forces may have been acting
8 to result in the final pattern.

9 Q Perfect. So the purpose of bloodstain
10 pattern analysis is not just to say this is an
11 impact pattern. It is to say what caused the
12 impact pattern, correct? For example --

13 A The purpose of reconstruction using
14 bloodstain pattern analysis is to identify actions
15 that occurred. So you don't use just the pattern
16 by itself to identify any other or specific actions
17 that occurred.

18 Q But because you are an expert in the
19 fluid dynamics of blood, according to you, you are
20 able to determine the causes of bloodstain
21 patterns, right, by looking at the patterns?
22 That's your expertise?

23 A It's looking at the patterns in the
24 context of the scene. Identifying what are
25 possible sources within the context of the scene.

1 Dalley Graff

2 Excluding what's not possible within the context of
3 the scene.

4 Q Okay. But you have a particular
5 expertise on how blood, for example, flies through
6 the air; right?

7 A I do know how blood travels through
8 the air.

9 Q Okay. Do you know how, as compared to
10 blood, brain tissue flies through the air?

11 A I do.

12 Q Okay. So what is -- let's stick with
13 blood for a second. What experiments have you
14 conducted in a controlled environment to confirm
15 how blood travel throughs the air?

16 A I've done a number of experiments
17 through the years since we teach bloodstain pattern
18 analysis and do these repeatedly.

19 Q Can you describe those experiments?

20 A Well, we do a number of them beginning
21 with simple blood falling to capture images of
22 blood as it falls, particularly when we have had
23 the advantage of having the equipment available.

24 When we were in France, we did high
25 speed photography so that you can see it from the

1 Dalley Graff

2 very beginning as the drop forms and as it falls
3 and the resulting pattern.

4 Q Okay.

5 A And I have looked at the work that
6 other people have produced looking at those high
7 speed to look at what happens as blood drops form,
8 what happens when they impact a surface. We look
9 at what happens when you have different surfaces.

10 Q So did you cite any of those
11 experiments that you either conducted or reviewed
12 in your report?

13 A I didn't list training materials or
14 training exercises or specific experiments in the
15 report.

16 Q Have you ever published any papers
17 regarding the experiments you conducted about how
18 blood flies through the air and how bloodstain
19 patterns are created?

20 A Not outside the training materials
21 that I make for my classes.

22 Q Okay. So have any of the training
23 materials that you've presented to your classes,
24 have they been peer reviewed by any scientific
25 journals?

1 Dalley Graff

2 A I did not submit them to a scientific
3 journal.

4 Q Have you ever submitted anything to a
5 scientific journal?

6 A I think the only one was one for a
7 Association for Crime Scene Reconstruction.

8 Q Okay. What was the topic of that
9 paper?

10 A That was a reconstruction of a death
11 investigation.

12 Q And was that paper published?

13 A It was published in the journal for
14 that professional organization.

15 Q Okay. But have you ever conducted an
16 experiment determining the cause of particular
17 bloodstain patterns and published the results of
18 that experiment in a peer-reviewed scientific
19 journal?

20 A First, I've done numerous experiments
21 to determine the cause of a particular pattern and
22 what forces may or may not be applied to that. I
23 have not published, other than the ones stated, in
24 a scientific journal.

25 Q Why do you think peer reviewing a

1 Dalley Graff

2 scientific journal is important, or do you not
3 think it's important?

4 A Well, I think you're asking two
5 different questions. Do I think peer review is
6 important, yes, I do.

7 Q I think my question is: for a
8 scientific journal to get published -- to get
9 published in a scientific journal, why do you think
10 it's important that you peer reviewed before you
11 get published in a scientific journal?

12 A Well, I think peer review is
13 important. Whether or not it's published, peer
14 review of the work is important.

15 Q Okay.

16 A And by extension if -- if you're
17 pushing a theory to other scientists, there needs
18 to be review whether before or after it's
19 published.

20 Q Okay. And why is that important?

21 A Because we're looking at a scientific
22 discipline and to try to be sure that we learn as
23 much as we can, and primarily to make sure that we
24 actually understand what is actually happening
25 within the blood as the patterns form. And then as

1 Dalley Graff

2 we -- if you go into reconstruction, to be sure
3 that your finding -- your conclusions are supported
4 in the scientific principles and not to overstate
5 or understate the conclusions.

6 Q And who peer reviewed your report in
7 this case that is marked at Exhibit 1 in this
8 deposition?

9 A In this case my husband did the review
10 of the report.

11 Q And do you think it's appropriate to
12 have your husband conduct a review of your
13 bloodstain pattern analysis?

14 A I think it's important that I had
15 someone who's certified as a bloodstain pattern
16 analyst to review it.

17 Q Do you live with your husband?

18 A I do.

19 Q Do you guys share expenses?

20 A We do.

21 Q Okay. Did you ask anybody else that
22 wasn't your husband to review your report in this
23 case?

24 A I did not.

25 Q Okay. Why not?

1 Dalley Graff

2 A In part because we're, you know --
3 he's my business partner, and my business partner
4 is reviewing my report.

5 Q Okay. So he has -- he shares in the
6 profits from your bloodstain pattern analysis
7 consultancy, correct?

8 A Well, I'm not sure I have a bloodstain
9 pattern analysis consultancy. We occasionally work
10 cases upon request.

11 Q But he's --

12 A But that's not the focus -- the main
13 focus our business; so I'm not sure about that.
14 The other thing is --

15 Q But he is your partner in that
16 business?

17 A He is my partner in the business,
18 correct.

19 Q You mean business partner as in
20 sharing profits, right?

21 A I mean primarily business partners in
22 that we do the work together, and that he has the
23 qualifications for doing the review as opposed to
24 going outside the company and hiring someone
25 outside the company to do the review.

Dalley Graff

Q Okay. I'll ask the question directly:
does your husband share in the profits of your
consultancy?

A Yes.

Q Okay. All right. Do you know who Tom
Bevel?

A Yes, I do.

Q Do you know who Ross Gardner is?

A Yes, I do.

Q Have you ever worked with them?

A I have.

Q Have you ever partnered with them?

A I was.

Q Okay. Are they considered authorities
in the field of bloodstain pattern analysis?

A Some people may consider them
authorities.

Q Do you?

A In some areas, I do.

Q Which areas did you consider them
authorities in bloodstain pattern analysis?

A In those areas which they state things
that are in agreement with the basic principles of
the fluid dynamics of blood.

1 Dalley Graff

2 Q Have you ever published a criticism of
3 their findings or any papers or textbooks that they
4 have written?

5 A No.

6 Q Have you ever reviewed any papers or
7 textbooks written by Tom Bevel or Ross Gardner?

8 A Yes, I have.

9 Q Are you in agreement with those
10 documents or disagreement?

11 A I would have to see in context any
12 particular portion. I agree with some of what is
13 published, and I may not agree in some points.

14 Q Okay. Is there some third-party
15 organization that would determine whether you're
16 right or they're right if there's a point of
17 disagreement, or is there not?

18 A Is there a -- there's not an
19 adjudication body that says you're right and you're
20 wrong. There's other scientists in the field that
21 examine both sides and agree or disagree on various
22 points or have different views.

23 Q Okay. So is there a credential for
24 becoming a bloodstain pattern analyst, or can
25 anyone become a bloodstain pattern analyst?

1 Dalley Graff

2 A I'm not sure what you mean by a
3 "credential."

4 Q Well, let me ask it a different way.
5 If someone holds themselves out as a bloodstain
6 pattern analyst, is there any credential that they
7 could get in trouble for not having if they were
8 doing that work? For example, as a lawyer, if I
9 got caught practicing law without a bar license, I
10 get in trouble. Is there an equivalent sort of
11 credential for bloodstain pattern analysts?

12 A There's not a bar as such, but I
13 believe there are various bars in various states
14 for attorneys; so you have to be on the bar of a
15 certain state. There are various jurisdictions
16 that hold different requirements for anyone doing
17 any type of forensic analysis and particularly for
18 presenting that in court and that varies for
19 different jurisdictions.

20 Q But I guess my question is: is there
21 any required credential for someone to hold
22 themselves out as a bloodstain pattern analyst?

23 A Again, I'm not really sure what you're
24 referring to as a credential. If someone...

25 Q You don't know what a credential is?

1 Dalley Graff

2 A I know what credentials are. If
3 you're asking about a required credential, I don't
4 know what is required. It varies in various
5 jurisdictions. Some jurisdictions you simply --
6 someone can just present themselves as such and
7 write a report, which may or may not be accepted by
8 the Court. Others require a certain -- a certain
9 level of degree before you're allowed to testify as
10 an expert. So it varies in various jurisdictions.

11 Q I'm not asking about admissibility in
12 court or credentials required for that. I'm asking
13 are there credentials required by any bloodstain
14 pattern analyst organizations that must -- that
15 someone must have before they can issue an opinion
16 on bloodstain patterns? Are you aware of any such
17 credentials?

18 A There are various credentials that
19 are -- that a person can get if they so choose, but
20 generally you have to, if you're accepted as a
21 bloodstain pattern analyst accepted by other
22 analysts or by the Courts, which is typically where
23 the -- the direction where those reports would go,
24 that varies.

25 MR. WHITE: Okay. I object to the

1 Dalley Graff

2 nonresponsive answer.

3 Q So what are the techniques used in
4 bloodstain pattern analysis?

5 A In bloodstain pattern analysis, you
6 want to examine as much as possible the bloodstain.
7 Look for the physical characteristics. Identify
8 those, again, things like the size and shape of the
9 overall pattern, size and shape of the individual
10 bloodstains within the pattern.

11 Look for the margins of particular
12 stains. Look for any variations across the
13 pattern. Look for volume. You look at the surface
14 that the bloodstain is on. Is it absorbent? Is it
15 nonabsorbent? We look at -- if you're looking at
16 something that is, for example, an impact spatter,
17 what are the size and shape and the distance
18 between individual stains? What's the destiny of
19 the pattern? And if you're doing reconstruction,
20 what within the context of the scene could provide
21 the blood and any forces that would create those
22 pattern.

23 Q So what are the models that predict
24 how bloodstain patterns are created?

25 A I don't know what you mean by models

1 Dalley Graff

2 in that sense.

3 Q Well, I guess, do you have any
4 scientific models that you use to predict how
5 bloodstain patterns are created?

6 A Again, I don't know how you're using
7 the word "models."

8 Q Was there any data that you used to
9 predict how bloodstain patterns are created?

10 A I look at the physical characteristics
11 that we know about blood. We look at how that --
12 how the patterns are formed. We actually do
13 experiments ourselves. If I think a bloodstain
14 could have happened this way, then I'd be sure that
15 I have at some point tried to duplicate that and
16 look at other possibilities.

17 In the context of the scene, is there
18 another possibility that could create the same or
19 similar pattern to see what can be excluded. Which
20 things do I know could not have done this? See
21 what -- what, in the context of the scene, could
22 have contributed to this pattern.

23 Q So I guess my question -- and maybe if
24 I give an analogy my question will make a little
25 more sense.

1 Dalley Graff

2 A meteorologist has reams of data from
3 the past that they have looked at or put into a
4 computer, and they have certain models or
5 algorithms that they have derived from the data,
6 and that allows them to analyze present information
7 and make predictions in the future.

8 So in your field of study, as sort of
9 a meteorologist of bloodstains, what prior data do
10 you look at when thinking about how the bloodstain
11 you're looking at in a particular investigation was
12 created?

13 A Well, metrology is quite different
14 from fluid dynamics; so it's a little hard to draw
15 that comparison.

16 Q You don't think meteorology involves
17 fluid dynamics?

18 A Not the same way that we look at the
19 blood as a fluid, if you I understand your use of
20 the term meteorology.

21 Q So I guess my question is: what data
22 do you look at to help create your analysis of a
23 bloodstain that you're analyzing?

24 A Again, I look at the size, shape,
25 margins, volume.

1 Dalley Graff

2 Q I'm not asking what you look at via
3 the pattern that you're analyzing and doing an
4 investigation. I'm asking about what prior data
5 informs your analysis.

6 A Well, prior data would be those
7 experiments that I have personally done with blood
8 and how I know I personally produced patterns that
9 look like this or that I have attended scenes where
10 certain types of injuries will always produce
11 certain types of patterns. How is this the same or
12 different from all of those where I have something
13 that gives me a known, if you will, for comparison?
14 And compare that to what I see here, in addition to
15 to this being blood and blood comes from the body
16 from what I know about anatomy and physiology and
17 what from that could result in the type of
18 bloodstain patterns that I see.

19 Q So you just described your prior
20 experiments that you personally conducted, right?
21 That's one set of data that you use; is that right?

22 A That's correct.

23 Q And those are experiments you've not
24 published the results of in any scientific journal,
25 correct?

1 Dalley Graff

2 A That's correct.

3 Q And you described your other
4 investigations of injuries and bloodstain patterns,
5 correct?

6 A That's correct.

7 Q And in all of those cases, your prior
8 investigations, did you always know what caused the
9 bloodstains?

10 A If I could add, I also do review what
11 is published by other experts in the field or
12 people who may be experts in the field and look at
13 their data and look at, for example, the high speed
14 videos particularly. For example, those that were
15 created by Michael Taylor and Epstein and -- forgot
16 the third one's name now.

17 Q Did you cite any of those in your
18 report?

19 A I did not list those in the report,
20 but those, again, are going back to high speed
21 videos and looking at known sources of blood, known
22 causes of bloodstains and how the bloodstains were
23 formed and what the result looked like. So not
24 just on the experiments that I have personally done
25 but what I have observed in others and what has

1 Dalley Graff

2 been published by others.

3 Q So in the cases where you knew the
4 cause of the bloodstain, could you tell us how you
5 knew the cause of the bloodstain?

6 A For example, a massive head trauma and
7 I can see the fragmentation and the cause of the
8 massive injury is present, such as self-inflicted
9 shotgun wound to the head and the shotgun is there.
10 So you know the source. And in the context of the
11 scene, there are no other sources available. So
12 this was the cause.

13 Q So do you have any known-cause
14 investigations in your past involving pedestrians
15 and motor vehicles?

16 A Yes.

17 Q Okay. Like what?

18 A Well, for example, the girl is run
19 over, and she's got a tire impression; and she has
20 an injury; and that matches to the bloodstain under
21 the vehicle that ran over her.

22 Q So the case -- what you just described
23 is a case where you concluded that -- from a
24 bloodstain, that a certain thing caused the
25 bloodstain; right?

1 Dalley Graff

2 I'm asking: are there any situations
3 that you've reviewed where you're looking at a
4 bloodstain and you know with no doubt what caused
5 it, either because you were there when it got
6 caused or there's a videos of it getting caused, as
7 opposed to a situation where you've reviewed a
8 bloodstain and use your analysis and concluded what
9 caused it?

10 A That I have reviewed direct
11 information such as a video of the act in progress
12 that led to the bloodstain, I have had situations
13 where that has happened. Like I said, one where
14 there is, obviously, in the context of the scene,
15 one and only one possibility.

16 Q Have --

17 A I also include DNA analysis and such
18 where other evidence, in conjunction with the blood
19 together, excludes outside or other causes.

20 Q Okay. Well, I guess what mathematical
21 models do you use to explain how bloodstain pattern
22 analysis is created -- strike that.

23 What mathematical models do you use to
24 determine how bloodstains pattern are created?

25 A If by mathematical model if you mean

1 Dalley Graff

2 like a specific algorithm that you just plug in and
3 here's what the result is, there's not one -- any
4 such thing that I'm aware of.

5 Q Okay. So what models, maybe they are
6 not mathematical, but what scientific models do you
7 use to explain how bloodstain patterns are created?

8 A Well, for some patterns you can see
9 that blood drops are projected toward a surface
10 based on the bloodstains that are on the surface
11 and then knowing how blood moves through the air.
12 And knowing that it's a parabola, we can
13 approximate the area of where it would have
14 originated.

15 Q So you said knowing how blood moves
16 through the air. What is -- is there a scientific
17 model for how blood moves through the air?

18 A Again, I'm not sure of how you're
19 using the term "scientific model." We know by
20 things like high speed photography watching these
21 what -- these events as they occur and watching
22 what blood does, and then testing what we think is
23 causing the blood to do that in the air and
24 actually reproducing those results in various
25 circumstances in controlled experiments.

1 Dalley Graff

2 Q So you think controlled, reproducible
3 experiments are important to establishing the
4 veracity of bloodstain pattern analysis?

5 A I think that you should have some type
6 of controlled experiments if you are going to say
7 this action caused this bloodstain, that you can do
8 that same action and create that same bloodstain.

9 Q Okay. Is there -- you just said blood
10 travels through the air as a parabola, right?

11 A The overall -- it's path is a parabola
12 through the air.

13 Q Okay. So can you describe
14 mathematically what a parabola is?

15 A I can describe -- depending on the
16 blood traveling, a parabola is something that has a
17 portion of its flight path is almost flat or
18 straight, but at some point it curves.

19 Q Okay. So are you aware that parabolic
20 flights, I mean that's a theoretical thing; right?

21 A It's an observable act.

22 Q So do you think -- are parabolic arcs
23 for projectiles produced in vacuum circumstances or
24 non-vacuum circumstances?

25 A It's been a long time since I studied

1 Dalley Graff

2 vacuums.

3 Q But you did say that your
4 understanding is that blood moves in a parabolic
5 fashion through the air?

6 A Yes.

7 Q Okay. But you don't know if that's
8 true whether it's in a vacuum or not in a vacuum?

9 A I've never done experiments with blood
10 in a vacuum.

11 Q Okay. Do you know if blood is a
12 Newtonian or a Non-Newtonian fluid?

13 A The issue of Newtonian and
14 Non-Newtonian was examined by Anita Wonder from
15 California a number of years ago, and I don't think
16 there is a single answer to that. In some -- it
17 has some characteristics of both depending on its
18 environment at the time.

19 Q So "it just depends" is your answer?

20 A I'm saying it's not a simple "yes" or
21 "no" answer.

22 Q Okay. So what would determine whether
23 or not it's a "yes" or "no" answer in a given
24 circumstances?

25 A That the characteristics of blood that

1 Dalley Graff

2 is under different forces when inside the body
3 versus outside the body. And the research that I
4 did -- the studies that I did a number of years
5 ago, particularly when Anita Wonder published her
6 book, was that it's not relevant to the bloodstain
7 patterns themselves.

8 Q Okay. So whether or not -- your
9 testimony is the characteristic of the blood,
10 whether it's Newtonian or Non-Newtonian, does not
11 effect bloodstain pattern analysis; right?

12 A I'm saying that blood has -- at least
13 at the time that I studied that, that it has some
14 of the properties of both.

15 Q Okay. So do you know whether
16 cerebrospinal fluid is a Newtonian or Non-Newtonian
17 fluid?

18 A I don't recall studying it in terms of
19 Newtonian or Non-Newtonian.

20 Q Okay. Have you studied or ever
21 published anything regarding how spinal fluid or
22 basically non-blood body fluids, the patterns they
23 make when they're spilled?

24 A To some degree, yes.

25 Q Not as much as bloodstain patterns, I

1 Dalley Graff

2 take it?

3 A Well, cerebrospinal fluid has some
4 properties that are different from blood and have
5 some differences. So, for example, I believe it
6 has a much lower viscosity, and so then we don't
7 see the same type of patterns that we see in blood.
8 That is it's much more difficult to look at it and
9 say, "Well, this was a single droplet in air that
10 was spherical in air." I don't know that that's
11 true of cerebrospinal fluid as much as it is of,
12 say, blood.

13 Q What about brain tissue? What have
14 you studied about brain tissue?

15 A Well, brain tissue is not a homogenous
16 substance. Blood is much closer to being
17 homogenous than brain tissue is. When we look at
18 cerebral tissue, you're looking at quite often some
19 connective tissue. You're looking at a lot of very
20 soft tissue, a lot of fluid in the blood.
21 Something that is very fragile. Something that
22 tends to break apart so...

23 Q So brain tissue is not a fluid per se?

24 A No, it's not.

25 Q Okay. So have you studied the flight

1 Dalley Graff

2 dynamics of brain tissue?

3 A Well, to my knowledge there's not a
4 specific flight dynamic for -- of, say, brain
5 tissue because, again, you're not talking about a
6 single homogenous substance. You're talking about
7 various types of cells grouped together, and then
8 some portions of brain tissue are going to have a
9 sort of a connective tissue type of covering, the
10 meninges.

11 Q But you have studied the flight
12 dynamics of blood?

13 A Yes.

14 Q Okay. And you've studied the patterns
15 that blood makes when it hits a solid surface,
16 right?

17 A Yes.

18 Q Okay. Now, you may not have published
19 on those, but you've studied those at length;
20 correct?

21 A Yes.

22 Q Okay. But on brain tissue, you
23 haven't studied the flight dynamics. And if I
24 understand your testimony correctly, it's sort of
25 impossible to guess at the flight dynamics of brain

1 Dalley Graff

2 tissue because it is not homogenous; correct?

3 MR. BUNT: Objection to form.

4 BY MR. WHITE:

5 Q You still have to answer.

6 A Well, I'm sorry. I'm not sure I
7 understand the question. As I said, I don't think
8 there's a single flight dynamic of brain tissue
9 because you're looking at different combinations of
10 tissues together. So if some of that -- like I
11 said, some of it is going to be more fluid than
12 others. Some is going to have some connective
13 tissue with it. Some brain tissue may have bits of
14 meninges that is adhered too; some maybe not.

15 Q All right. Just a second. Okay. So
16 let's look at -- I'm going to mark this as Exhibit
17 No. 4.

18 (INVESTIGATIVE ANALYSIS & CRIME SCENE RECONSTRUCTION
19 COURSE INFORMATION RECEIVED AND MARKED AS PLAINTIFF'S
20 EXHIBIT 4 FOR IDENTIFICATION.)

21 BY MR. WHITE:

22 Q Do you recognize that document?

23 A I have not seen it before now. I
24 recognize the logos and such.

25 MR. WHITE: Let's go ahead and get it

1 Dalley Graff

2 marked. If you hand it back to me, I'll put a
3 sticker on it.

4 Q Is that a marketing flier for one of
5 your trainings?

6 A It appears to be.

7 Q Okay. So on there, do you see where
8 it says that you have a five-step process for
9 accident reconstruc -- I'm sorry -- or crime scene
10 reconstruction? I believe it's the fourth bullet
11 point down on the second page.

12 A Yes, I see that.

13 Q What is your five-step process for
14 correlating evidentiary relationships between scene
15 evidence?

16 A The five steps as we list them would
17 be to begin with review so you know what materials
18 you have available.

19 Organization, to have a system to
20 organizes all the information that you have so that
21 you can locate it as you need it for quick
22 reference and for later review and audit of the
23 information.

24 Then preparing for analysis, which
25 would be things like looking at images, looking at

1 Dalley Graff

2 them at 100 percent, adjusting the histograms to
3 see what you can see in dark places depending on,
4 again, things like the quality of the image,
5 whether it's in the correct format and those kinds
6 of things to possibly -- depending on what kind of
7 reconstruction possibly even do a three-dimensional
8 model, virtual models to help understand the
9 three-dimensional dynamics.

10 So preparation and then analysis would
11 be actually looking at specific, for example,
12 bloodstain patterns. What are the characteristics
13 of those patterns? Describing those
14 characteristics. See how that relates to other
15 evidence, such as wounds, potential forces, such as
16 weapons what's available in the context of the
17 scene. Consider all -- all scenarios presented by
18 the evidence and scenarios that others might
19 present and to analyze those.

20 And then I think the last step is
21 conclusions and reports to do things like flowchart
22 and see what items of evidence relate to each other
23 where you can and cannot establish connections
24 whether you can or cannot establish sequence of
25 events so identifying actions that must have

1 Dalley Graff

2 occurred to produce the evidence as it's available
3 and then try to sequence those actions if possible.

4 Q Okay. So let's jump to the report
5 here. I'm trying to move through this quick
6 because I know we're short on time. So if you'll
7 go to page 1 of your report. Do you see Footnote
8 No. 1?

9 A Okay.

10 Q What do you mean when you say "A
11 bloodstain pattern is one or more related
12 bloodstains created by a single action"?

13 A I mean that a bloodstain pattern is
14 made up of one or more bloodstains that are all
15 created by a single action.

16 Q What do you mean by a "single action"?

17 A For example, if you're looking at a
18 pattern that you say that's a castoff, which would
19 be -- would indicate that something that had wet
20 blood on the object was in motion so that it
21 separated from a ligament of blood, which then
22 separated into individual droplets, which then
23 struck a surface and would have specific
24 characteristics, such as a fairly linear
25 distribution on the surface and a progressive

1 Dalley Graff

2 change in shape within the individual stains within
3 that pattern. So a single action that would have
4 produced them is the movement of a bloodied object.

5 Q Okay. So in this investigation of the
6 case at hand here from April 30, 2022, are you
7 assuming or do you conclude that Nehemias was
8 initially hit and then struck the Toyota Camry?

9 A Based on the bloodstain, there is an
10 impact pattern. And from the impact pattern, we
11 can approximate the area of impact, and then there
12 is another pattern of blood and tissue that's in a
13 different place and different orientation and
14 therefore two different impacts.

15 Q So would it be fair to say then that
16 you're looking at all the patterns of blood and
17 various other things in this accident and concluded
18 that there were two actions?

19 A Well, there are two related actions
20 because the one kind of caused the next, but
21 they're still separate actions, even though they
22 happened very, very short in time; but they're
23 actually separate actions.

24 Q Okay. So -- but you're -- just to
25 make sure I got it 100 percent right, your thinking

1 Dalley Graff

2 or conclusions are that there are two impacts that
3 caused the various bloodstain patterns on the scene
4 in this case?

5 A That there are at least two, yes.

6 Q Do you think it's possible there are
7 three?

8 A Certainly. There can be more than
9 that.

10 Q Well, I'm trying to figure out what
11 your opinion is. Do you think it is two, or is it
12 at least two? And if it's at least two, how many?

13 A There's at least two. One that makes
14 the impact pattern on the central barrier that's a
15 separate pattern from what's on the right side and
16 toward the front of the car.

17 Q And so do you think that the impact
18 pattern or the impact pattern on the barrier, using
19 your words, was that from the initial impact?

20 A In my opinion, that would have to be
21 from the initial impact.

22 Q Okay. So you think of at least three
23 actions that caused bloodstain patterns in this
24 case. The first one was the impact with the Ford
25 Explorer that caused the impact barrier on the

1 Dalley Graff

2 median barrier?

3 A I think there was an impact to the
4 blood source -- which in this case, from the
5 information that I have, would be something that
6 caused an open head wound and therefore would
7 project blood. And we see just the blood going
8 towards that wall.

9 Q So your conclusion is that the impact
10 pattern on the median barrier is blood from
11 Nehemias' head?

12 A Based on the available information, I
13 see evidence looking at the overall scene that is
14 consistent with an open head trauma, and that would
15 be consistent with an impact to the head causing
16 the bloodstains on the barrier.

17 Q But there -- you haven't reviewed an
18 autopsy of Nehemias Santos' body, right?

19 A No.

20 Q Okay. Have you reviewed a pathology
21 report on Nehemias Santos' body?

22 A No.

23 Q What have you reviewed to determine
24 the injuries on Nehemias Santos' body from April 30
25 of 2022?

1 Dalley Graff

2 A There's evidence at scene that would
3 be consistent with an open head wound.

4 Q Okay. Is there evidence at the scene
5 of other injuries caused to Nehemias Santos?

6 A I don't have anything I could point to
7 other than the evidence that is consistent with an
8 open head wound. He may have had other injuries.
9 I don't know.

10 Q So it's possible?

11 A He could have had other injuries.
12 That's possible. I don't know.

13 Q Okay.

14 A It doesn't change the part that I do
15 know.

16 Q Okay. But were you -- in a perfect
17 world, would you have preferred to have gotten an
18 autopsy report on Nehemias Santos?

19 A I could have done more with the
20 analysis had I had a thorough examination of his
21 wounds, such as what would be presented from an
22 autopsy.

23 Q And there's no pathology report that
24 you've reviewed that shows what the droplets that
25 you've analyzed consisted of, is there?

1 Dalley Graff

2 A I'm sorry. I'm not sure if I
3 understand the terms you're using. Nobody
4 collected droplets in the air. There's the stains
5 on the surface.

6 Q So is it common practice for
7 bloodstain pattern analyst to use reagents -- I
8 think that's how you pronounce it -- to determine
9 where blood is at a scene?

10 A The term is reagents.

11 Q Reagents.

12 A And various reagents are used to
13 identify, if possible, what is suspected as blood.
14 It's not always required. But if it's
15 questionable -- if you're not certain, then there
16 are tests to do.

17 So you may have a stain that's sort of
18 a brownish color that could possibly be dried
19 blood, then I would use the reagent -- personally I
20 prefer the Kastle Meyer test. And if that's
21 positive, then you move forward with the analysis.

22 Q Were reagents for the Kastle Meyer
23 test used on this scene involving Nehemias Santos?

24 A Not that was reported to me.

25 Q Okay. So let's go to page 3 of your

1 Dalley Graff

2 report. So at the first sentence at the top of
3 this page says: "A wide path of blood/fluid was on
4 the pavement approximately parallel to Nehemias
5 Santos' left side." Do you see that?

6 A Yes.

7 Q Okay. Is blood/fluid a term of art
8 for bloodstain pattern analysts?

9 A I don't know that it's a -- you say a
10 form of art.

11 Q A term of art. Sorry.

12 A A term of art. It's a simple way in
13 the English language that sometimes if you have two
14 things together that it could be either/or, and/or,
15 or both.

16 Q So you don't know if what you're
17 looking at is just blood or fluid or maybe both?

18 A It does appear to be primarily blood;
19 however, there are some characteristics there that
20 appears that there is a mixture of other fluid.

21 Q You don't know what those other fluids
22 are, right?

23 A Well, I think in the context of the
24 scene, given that everything is consistent with a
25 massive -- or an open head wound, the cerebrospinal

1 Dalley Graff

2 fluid would, in fact, in an open head wound would
3 be mixed with the blood.

4 Q So is it possible if there's -- if
5 fluids related to a vehicle mixed in?

6 A I don't see any evidence of
7 petroleum-like fluid.

8 Q What about, like, a transmission
9 fluid?

10 A Again, it's a petroleum-type fluid.

11 Q Well, what about -- sorry -- fluid for
12 a radiator?

13 A I think you're referring to water.

14 Q No. I think there's, you know, you
15 can put non-water substances in a radiator. But, I
16 mean, do you see any automobile fluid -- besides on
17 this (indicating) -- in the materials you reviewed
18 for this case?

19 A I don't see anything that looks like
20 it's a petroleum based mixed with the bloodstains
21 that I see.

22 Q Okay. So now you see in Footnote
23 No. 6 here, you see: "For purposes of this report
24 'tissue' refers to masses that appear to be
25 comprised of cerebral material, body fat, and body

1 Dalley Graff

2 fluid"?

3 A Yes.

4 Q Okay. So is it normal for bloodstain
5 pattern analysts to discuss how tissue is cast via
6 an impact?

7 MR. BUNT: Objection to form.

8 BY THE WITNESS:

9 A I think it would not be unusual for
10 someone in a bloodstain report to refer to tissue
11 and bits of tissue being present. That's not the
12 same as saying specifically the pattern as such,
13 other than, say, the distribution of those of the
14 bits.

15 BY MR. WHITE:

16 Q And are you trained on analyzing the
17 patterns created by tissue?

18 A I certainly can describe what I see.

19 Q But can you draw conclusions from
20 patterns of tissue that you see?

21 A To some extent, yes.

22 Q Based on what experiments?

23 A Well, it's not. It's based on
24 observation. But looking at brains over the years
25 and how the brain tissue holds together or doesn't

1 Dalley Graff

2 and seeing the pulverized pieces basically where
3 the pieces come apart and land on the surface, I
4 know they didn't start on the surface. So they had
5 to have come from the body.

6 Q So you don't have any experiments you
7 conducted with tissue or brain matter or skull
8 fragments, right?

9 A With -- with tissue from a body, that
10 would be unethical if you're talking about doing
11 experiments on a person's brain to see what the
12 brain tissue would be. But I have done experiments
13 with tissue, say, animal tissue to see what happens
14 in certain -- in certain circumstances.

15 Q Have you published the results of
16 those experiments?

17 A Not outside of casework.

18 Q Okay. So those experiments and your
19 publications have not been peer reviewed?

20 A Not other than presentations I've made
21 at various professional organizations.

22 Q Okay. So on page 3 you say "a
23 drag-like mark on the pavement extended from
24 Nehemias Santos' right foot." What does a
25 drag-like mark on the pavement mean?

1 Dalley Graff

2 A It was a mark on the pavement that
3 went from -- extended from his foot to the blood
4 pool out on the roadway, and it looked like
5 something had been dragged to create that.

6 Q Okay. So can you point out where that
7 drag-like mark is on Figure 4 of your report?

8 A I don't think it's quite visible or
9 certainly not the whole pattern visible in
10 Figure 4.

11 Q Okay. So you say in your report that
12 Nehemias Santos' injury or his cause of death was
13 blunt force trauma, right?

14 A I said that?

15 Q So on page 3 you say: "The cause of
16 death was reported as blunt force trauma." Do you
17 see that?

18 A Yes. I see that I cited the State of
19 Texas Certificate of death.

20 Q Okay. But there was no medical report
21 that you reviewed, right, to reach an independent
22 conclusions that he died of blunt force trauma?

23 A It's not an independent conclusion.
24 It's the conclusion stated on the State of Texas
25 Certificate of Death.

1 Dalley Graff

2 Q Okay. Now, if you look at Figure 3,
3 can you identify all of the possible injuries to
4 Nehemias Santos?

5 A No.

6 Q Okay. Do you see -- I mean, do you
7 see what appears to be something on his head,
8 right?

9 A Yes.

10 Q Okay. Do you see where his right
11 shoulder -- his shirt is torn?

12 A Yes.

13 Q Do you see blood on his right arm?

14 A It appears to be blood all along the
15 surface of his arm.

16 Q Does it appear that his pants and most
17 of his clothing are soaked with blood?

18 A It appears that way.

19 Q Okay. Is that incorrect? I mean,
20 would you conclude from what you see that his
21 clothes are soaked with blood?

22 A It's hard to determine from just this
23 picture. It appear that they very well may be
24 saturated.

25 Q Okay. What about his right leg? Does

1 Dalley Graff

2 his right leg appear to be injured?

3 A I cannot tell from this picture.

4 Q So if you see in your Footnote No. 8,
5 do you see where you cited a police report saying
6 that the right leg was obviously broken?

7 A Yes.

8 Q Do you agree that, looking at
9 Figure 3, it looks like his right leg is broken?

10 A I cited that the officer said right
11 leg was obviously broken. However, she didn't
12 detail why she said it was obviously broken. And I
13 cannot -- looking at this picture, I cannot tell
14 you what the state of his leg is.

15 Q Just because it's not a good enough
16 photo, I guess?

17 A It's not from the right angle to tell.

18 Q Okay.

19 A The right leg may or may not be in a
20 position that looks broken.

21 Q Okay. So, right. For you to know if
22 he had a broken right leg -- a fracture in his
23 right leg, you'd probably have to look at a report
24 done by some sort of forensic examiner; right?

25 A Well, for me to say whether or not I

1 Dalley Graff

2 thought it was broken, I would need to see
3 something that was an obvious dislocation or a
4 position that the leg could not be in if the bones
5 were in tact.

6 Q And -- and you have --

7 A Or something like that. Or a
8 medical -- some medical examination that actually
9 says, "Yes, the bone is broken."

10 Q And you haven't been seen anything
11 like that in this case? So you just don't know if
12 his right leg is broken?

13 A I don't know.

14 Q Okay. So in Figure 4, here you've
15 highlighted an area and captioned it as
16 "Bloodstains on barrier." What was your basis for
17 doing that?

18 A The basis for doing that is looking
19 closely at this image that is not whole image but
20 zooming into this area and referring to other
21 images of the same area.

22 Q Okay. How do you know that the stains
23 on the median barrier are blood?

24 A They appear to be blood to me
25 primarily. But, again, looking at all the images

1 Dalley Graff

2 together and in particular comparing those
3 different ones. One of them I could see what
4 appears to be extensions from the original
5 impact -- the leading edge of that stain and tails,
6 if you will, where the blood would have collected
7 toward the termination or the ends of those trails,
8 and I have seen that same thing numerous times in
9 bloodstains.

10 Q Okay. So you've said you've seen it
11 numerous times in bloodstains, but that seems a
12 little circular. How do you know that that is
13 blood on the barrier?

14 A Again, that's based on my observation
15 and my experience over the year.

16 Q Okay. How do you know it's not other
17 body fluid?

18 A Other body fluid doesn't act quite
19 like that.

20 Q Okay. What experiments have you
21 conducted with non-blood body fluids that tell you
22 how -- what sort of patterns those fluids make, for
23 example, on a barrier?

24 A Well, I've looked at the difference
25 between blood and other fluids. So body fluids, it

1 Dalley Graff

2 depends on what specifically you're talking about.
3 But those with much lower viscosity, for example,
4 urine, would do about what water does or similar.
5 That's not what blood does.

6 Q Okay. I mean, there's obviously
7 different kinds of body fluids other than blood and
8 urine. How do you know that the marks on the
9 median barrier there are not blood mixed with some
10 other body fluid?

11 A There may be traces of cerebrospinal
12 fluid or --

13 Q It's possible?

14 A It would be traces because if you had
15 very much of the other in it, then it would not
16 have this appearance.

17 Q Because your testimony is you know how
18 all body fluids act when they are cast onto a
19 barrier?

20 A Not all body fluids. There are some
21 body fluids I have not tested for the same
22 patterns.

23 Q So -- so then how do you know what
24 made those patterns on the barrier, if you haven't
25 tested all body fluids?

1 Dalley Graff

2 A Well, the other body fluids I can
3 think of that I have not tested are definitely not
4 that color.

5 Q Okay. So what is the resolution of
6 the photos you reviewed in your report.

7 A I think I'd have to go back and
8 recheck. I think the resolution of this one -- I
9 think it was 300 by 300.

10 Q Okay. So -- and your opinion is you
11 can reach an expert opinion by reviewing
12 photographs of that resolution and doing a
13 bloodstain pattern analysis; is that right?

14 A By looking at everything in the scene
15 and by looking at the various images and comparing
16 them to be sure that what I'm seeing in one is
17 present in the other in some degree.

18 Q Okay. So you said that the stains on
19 the median barrier are quote, mostly circular.
20 What does that mean?

21 A That they're more round than
22 elliptical.

23 Q Okay. So when you say more round than
24 elliptical, I mean you can measure any elliptical
25 stain; right?

1 Dalley Graff

2 A Yes.

3 Q And you do that by measuring the minor
4 and the major axis of the elliptical stain?

5 A Depending on the target surface, yes.

6 Q Did you do that here?

7 A No.

8 Q Why not?

9 A Because the stains are more circular
10 and measuring individual stains doesn't really give
11 you any more information. It's still fairly
12 circular, and there's a lot of potential error in
13 measurements the more circular that the stain is.
14 So there's no point in doing any specific
15 measurements to say, "Well, this is between 70 to
16 90 degrees."

17 Q So when you said that the stains on
18 the barrier are mostly elliptical -- or are mostly
19 circular, do you mean that most of the stains are
20 circular and there's a couple that are elliptical,
21 or are you saying that all of the stains are
22 circular?

23 A That, basically, all of the stains
24 that I could identify had a rounded leading edge;
25 so they originated as spheres before they impacted

1 Dalley Graff

2 and then formed the stains on the wall. That --
3 and that the angle of most of them, based on that
4 shape, was somewhat perpendicular being anywhere
5 from -- well, it could be directly 90 degrees to
6 about the center. Some of them look very, very
7 circular. When you move to the north end of the
8 pattern, some of them have a little bit more of an
9 elliptical shape, not quite as rounded on the west
10 end of the pattern.

11 Q Well, that median barrier runs north
12 to south, right? So are you saying --

13 A Okay. I'm sorry. From the north to
14 the south end. So the north end, they seem to be
15 more circular than more to the south end. The
16 south end, you tend to see a little bit more
17 directionality to the individual stains.

18 Q And that -- and I appreciate that
19 detail. That's not in the report here, right?
20 That the elliptical nature changes on the barrier,
21 is it?

22 A There still mostly circular and
23 elliptical.

24 Q Okay. But you've added some detail,
25 right?

1 Dalley Graff

2 A Some of those. And, again, you have
3 to look at them individually by going back to all
4 of the pictures.

5 Q And have you reviewed each drop
6 individually?

7 A As many of them as I could focus on.

8 Q Okay. If you could go back, would you
9 maybe change this part of your report where you
10 said it's mostly circular and maybe say they're
11 circular on the north part of the barrier but more
12 elliptical as you head south on the barrier?

13 A I don't think that it's a significant
14 change to say that. They're still mostly circular
15 to elliptical.

16 Q Okay. But do you agree that
17 explaining which direction on the barrier they're
18 circular versus where they're elliptical would add
19 some detail here, right?

20 A I don't -- I don't necessarily agree
21 that changing those words changes the meaning at
22 all.

23 Q Okay. So in, I believe we're on
24 page 4, Figures 8 and 9, you've identified some
25 stains. Do you see those?

1 Dalley Graff

2 A Yes.

3 Q Okay. So is it your expert opinion
4 that these are bloodstains?

5 A They are not all bloodstains.

6 Q Okay. How do you tell which ones are
7 blood and which ones are not?

8 A Well, looking at Figure 8, some of
9 those stains don't have very much color -- the
10 color that blood would be. And some of those that
11 that are very elliptical don't have tails, which
12 would be where the concentration of cells would be.
13 Then it would be darker in the tails. That happens
14 with blood. That does not happen with other
15 fluids. So some of them appear to be possibly
16 blood-tinged, so some fluid that's not specifically
17 blood.

18 Q Okay. So you think those -- at least
19 some of the patterns shown in Figures 8 and 9 are
20 not bloodstains?

21 A That they are not primarily blood.
22 They're blood-tinged, but they appear to be some
23 other fluid in connection with blood.

24 Q And can you explain the difference or
25 how are patterns different when it's not blood

1 Dalley Graff

2 primarily creating the stain?

3 A When it's something of a significantly
4 different viscosity, such as water will make a
5 different pattern -- have a different pattern. Be
6 more dispersed. Breaks up more than blood does.
7 It's closer to blood. So you can still have
8 whatever the fluid is having its viscosity to it
9 that it holds together so you still get an
10 elliptical stain with the fluid continuing to form
11 the tail for directionality, if you would.

12 Q So by looking at a stain what you're
13 saying is you can guess whether or not the
14 viscosity of the fluid was close to blood or not
15 like blood, right?

16 A I'm not guessing the viscosity. I'm
17 saying that as a result of the stain that if you
18 compare it to other fluids, that whatever this is,
19 if it has the same characteristics or similar to a
20 bloodstain, then it must have had similarities as a
21 fluid to blood and therefore be, for example,
22 closer in viscosity to blood than water.

23 Q So if you saw a pattern that it looked
24 like it had a similar viscosity to blood, that
25 doesn't tell you whether or not it's blood or not;

1 Dalley Graff

2 it just tells you that you're looking at a fluid
3 that has a viscosity similar to blood; right?

4 A I'm sorry. I don't follow.

5 Q So if you see a pattern, what you're
6 saying is you can analyze the viscosity of the
7 liquid that created that pattern; right?

8 A I'm not measuring the viscosity from a
9 stain. I'm simply saying that stains with --
10 fluids with similar viscosity can have similar
11 characteristics in the stains that are formed.

12 Q So if I -- so if you know the
13 viscosity of a fluid, you can predict what the
14 patterns made by that fluid will look like?

15 A Not from viscosity alone.

16 Q Okay. So what else would you need to
17 know?

18 A Well, what is the fluid? Is it a very
19 homogenous fluid, or is it a mixture?

20 Q Okay. So you have to know what the
21 fluid is before you can predict what patterns that
22 fluid would make?

23 MR. BUNT: Objection to form.

24 BY MR. WHITE:

25 Q I mean, that's what you just said,

1 Dalley Graff

2 right?

3 A I don't know what you just said.

4 MR. BUNT: Same objection.

5 BY MR. WHITE:

6 Q So you have to know what a fluid is
7 before you can predict what patterns that fluid
8 will make, right?

9 A I'm not predicting what patterns it
10 will make. I'm looking at the patterns that were
11 made. And if the patterns that were made have
12 this -- some similarities to what we see in blood,
13 then, by extension, that means that there are some
14 similarities in those fluids. But I'm not saying
15 what the viscosity was, and I'm not predicting what
16 some other fluid, not blood, would do that.

17 Q So you understand that a prediction is
18 just another word for a hypothesis about what
19 happens, right?

20 A No.

21 Q So you don't think hypotheses are
22 predictions?

23 A I don't think the two terms are
24 synonymous.

25 Q Okay. So have you ever made

1 Dalley Graff

2 hypotheses about how patterns will form based on an
3 ejected fluid?

4 A A hypothesis is based on the evidence
5 at hand. A hypothesis is, if you will, an educated
6 guess. Here's what I think could have made this.
7 That's a hypothesis. Then you test the hypothesis
8 to see if, in fact, this could create that. That's
9 hypothesis.

10 Prediction says I know this will
11 happen. And those are two different things.

12 Q Okay. So when you look at the
13 elliptical stains on, say, Figure 8, based on what
14 you're looking at there, can you determine whether
15 or not -- like you said, that's a blood-tinged
16 fluid? Do you know what kind of fluid it is?

17 A I don't specifically know in the
18 context of the scene. I look at what's available
19 in context of the scene. Given that there appears
20 to be some cerebral matter in the scene, then
21 cerebrospinal fluid I know is associated with that.
22 I know that the tissue gets there because it had to
23 be in flight coming from a source. So therefore
24 the fluid along with it would come from the source.

25 Q Well, how do you know that these

1 Dalley Graff

2 elliptical stains were created by a fluid
3 associated with this accident?

4 A I just look at the entire car to see
5 if there's anything similar because I also look at
6 what's across the glass and what's on the trunk lid
7 and what's on the other side of the vehicle.

8 Q Well, I mean, is it possible that
9 those are just streaks from some sort of, like, a
10 prior car wash on Figure 8?

11 A They're not consistent with a car
12 wash, which is primarily water.

13 Q What about soap?

14 A That would be a very strange way to
15 put soap on a car.

16 Q So are you an expert on how soap dries
17 on cars?

18 A I wouldn't say I'm an expert.

19 Q So how do you know that those streaks
20 in Figure 8 or even Figure 9 aren't organic matter
21 from bugs or soap or anything not related to this
22 accident?

23 A Well, we have two different things
24 between Figure 8 and Figure 9.

25 Q Well, take them both one at a time.

1 Dalley Graff

2 A Well, Figure 9, there's an overall
3 pattern. There's very similar stains in the same
4 orientation over the same part of the car. There
5 appears to be a single source to have those
6 similarities.

7 Q So you're concluding that because you
8 see patterns that seem to have the same source,
9 then they must be related to the accident? That's
10 your expert conclusion?

11 A In the context of the scene and
12 looking at all of the images of the car. I don't
13 see for example these things on the front end of
14 the car. So I looked at all of the images of this
15 car looking for anything similar to this. I don't
16 find it anywhere other than here in this and
17 comparing this to pictures of the other side of the
18 trunk.

19 Q Okay. So how do you know the things
20 that you circled in Figure 9 are, in fact, fluid
21 stains?

22 A That's just my observation. That's
23 what they appear to be.

24 Q Okay. But you didn't test them in
25 person or anything like that, right?

1 Dalley Graff

2 A No.

3 Q Okay. So they just look like black
4 flecks, right? I mean, is that a fair description?

5 A No. I wouldn't describe them as black
6 flecks.

7 Q So there's some black flecks, like,
8 immediately to the right of the light that you
9 didn't circle. Do you see those on Figure 9?

10 A I'm sorry. Figure 9?

11 Q Uh-huh.

12 A Figure 9, I outlined just a few, not
13 all of them. There was no attempt to outline every
14 single stain.

15 Q So do you think that every black mark
16 on Figure 9 is a bloodstain?

17 A I don't know.

18 Q Okay. Why don't you know?

19 A Well, one thing because I can't see it
20 printed in this small print, but at the time I just
21 highlighting certain stains that I could
22 identify -- that I felt I could identify.

23 Q So you're saying that those other
24 stains in Figure 9 might not be related to the
25 accident or might not be bloodstains?

1 Dalley Graff

2 A They appear to be bloodstains. They
3 appear to be related to these, but I don't recall
4 now what all I looked at there. But I would just,
5 again, highlighting a sample of what I see and what
6 I could identify as stains.

7 Q Well, so your expert -- is your expert
8 conclusion that all those black stains in Figure
9 9 -- sort of in the light area, by the light --
10 that those are all bloodstains?

11 MR. BUNT: Objection to form.

12 BY THE WITNESS:

13 A Without looking at it in a view where
14 I can actually see them, I can't tell if there are
15 any that I would exclude as being bloodstains.

16 BY MR. WHITE:

17 Q Okay.

18 MR. BUNT: It's 10 after 1:00 so...

19 MR. WHITE: All right. So I guess
20 that's as much as I'm going to get today,
21 unless you want to give me a little latitude.

22 MR. BUNT: I can give you about five
23 more minutes.

24 MR. WHITE: Okay. All right. Let me
25 get to the fun stuff.

1 Dalley Graff

2 Q Let's go to page 7. Just let me know
3 when you're there. So you see Figure 19 of your
4 report?

5 A Yes.

6 Q Okay. So you say "In the context of
7 this scene, if the Explorer damage was caused by an
8 impact with Nehemias Santos' head, then Nehemias
9 Santos' head was lower to the level of Explorer
10 headlight." Do you see that?

11 A Yes.

12 Q Okay. So is it your conclusion or
13 your assumption that Nehemias Santos had his head
14 struck on the right side by the Ford Explorer?

15 A I would say it's neither.

16 Q Okay. What would you say it is?

17 A That if his head, wherever the wound
18 is, was injured in this impact, then his head has
19 to be in the area of damage to the Ford Explorer.
20 So if it's -- so if the initial wound is to the
21 right side, then this would be an approximation for
22 where his head would be and then by extension the
23 posture of where his head would be. It's simply an
24 approximation.

25 Q So do you know that the initial impact

1 Dalley Graff

2 was to the right of Nehemias Santos' head?

3 A I don't know that.

4 Q Have you concluded that from reviewing
5 the evidence? Is your expert opinion that the
6 initial impact was to the right of Nehemias Santos'
7 head?

8 A It's only based on the fact that there
9 is a towel or something that's pressed to the right
10 side of his head.

11 Q Is it possible that something else was
12 the initial -- a different part of his body was
13 struck by the Ford Explorer as part of the initial
14 impact?

15 A I saw evidence in the scene of an open
16 head wound, regardless of whether the initial
17 impact is to the side or the top or even the left
18 side, I don't know because there's not a
19 documentation specifically of the wound, other than
20 the image I captured where they had put something
21 to the right side of the head.

22 Q Okay. All right. It's not a trick
23 question. I take that to mean you do not have an
24 expert conclusion about how the impact to the right
25 side of his head occurred, right?

1 Dalley Graff

2 MR. BUNT: Objection to form.

3 BY THE WITNESS:

4 A I see evidence in the scene that he
5 had an open head wound; therefore, if -- as I say,
6 if the damage to the vehicle was associated with
7 that wound, then his head has to be at the level of
8 that damage.

9 BY MR. WHITE:

10 Q And you're saying "if" because you
11 don't know if his head was what caused the damage
12 to the headlight area of the Ford Explorer?

13 A Other than in the context of the
14 scene, I didn't find any other. Because it's not
15 caused by an impact with the Camry. So what else
16 in the scene? There's nothing else in the context
17 of this scene that provides a source of that
18 damage.

19 Q But you don't know if maybe Nehemias'
20 shoulder hit the headlight area or if some other
21 part of his body hit the headlight area and then
22 the head injury occurred subsequently? You just
23 don't know, right?

24 A Well, I know that something has to hit
25 the head, and I don't see any evidence of a

1 Dalley Graff

2 catastrophic injury to either of the shoulders.

3 Q But, I mean, you don't know if there's
4 an injury to his shoulder? You've already
5 testified to that, right?

6 A Well, there could be an injury. I
7 said catastrophic. Something that could produce --
8 that an impact would produce the bloodstains that
9 we see on the barrier.

10 Q Okay. But you don't know if his head
11 hit the road or his head hit the Camry or his head
12 hit the Ford Explorer, right? You just don't know
13 between those possibilities, right?

14 A Well, I don't think there's evidence
15 that his head could have hit something after the
16 wound was opened.

17 Q Okay. But you don't know what opened
18 the wound in his head, right?

19 A In the context of the scene, the only
20 source that I find in the scene context is the
21 Explorer.

22 Q So if his head hit the road, right, is
23 it possible that any evidence of that got covered
24 up after his body got moved behind the Camry?

25 A The head just hitting the road, say,

1 Dalley Graff

2 from a fall is not going to produce the open head
3 injury that would then lead to the evacuation of
4 the Calvarium, which is what the evidence appears
5 to show.

6 Q So in you're saying if -- in your
7 opinion, if Nehemias Santos' head was slapped down
8 on the pavement, it wouldn't have produced an open
9 head wound?

10 A Well. It wouldn't produce --
11 depending how it impacted.

12 Q So it's possible?

13 A It's possible that a hard impact to a
14 roadway can certainly cause a skull fracture,
15 possibly cause an open head wound. However, it
16 would have to somehow bring that head back up to a
17 place where cerebral tissue could be expelled or
18 projected along the right side of the car, the roof
19 of the car, towards the trunk, the open lid of the
20 trunk, and to leave and to go down and be on the
21 pavement behind the car.

22 So that's not consistent with falling
23 to the ground and having that kind of injury or to
24 have that injury caused by the pavement. It
25 wouldn't be able to get up from there.

1 Dalley Graff

2 Q But you're not an expert on the flight
3 dynamics of brain tissue, correct? You already
4 told us that, right?

5 A Again, there's not such a thing as a
6 simple flight dynamics of brain tissue. We can see
7 what happens when tissue is moving through the air
8 and some of the characteristics and how that's
9 different from, say, a fluid going through the air
10 because now you have these pieces that are not
11 homogenous, don't always stay together, may come
12 apart. There's various things that happen to a
13 mass of tissue that would not happen with blood.

14 Q So it's hard to predict how tissue
15 moves through the air because it's not homogenous,
16 right?

17 A And I'm not predicting. I'm simply
18 stating the conclusions that I've observed in the
19 result.

20 Q So you've never performed
21 hypothetical -- you've never performed experiments
22 on how tissue moves through the air, right?

23 MR. BUNT: Objection to form.

24 BY THE WITNESS:

25 A I have observed and studied videos of

1 Dalley Graff

2 actual woundings at the time they have occurred. I
3 have done some experiments myself to simulate, for
4 example, what might happen with, say, brain tissue
5 by shooting into animal tissue, not living animals,
6 to simulate and see if this action would produce a
7 result similar to what's seen in the scene.

8 BY MR. WHITE:

9 Q What is a dispersion cone?

10 A A dispersion cone is when some force
11 causes, for example, blood, to be projected from a
12 source, and as it moves away from the source
13 individual droplets move farther away from each
14 other, and the three-dimensional result in the air
15 is called a dispersion cone.

16 It's not a physical cone. It's not an
17 exact location. It's a general area. So if it
18 hits a target surface, the farther away from the
19 source it is, generally the less dense the
20 individual stains in the pattern will be.

21 Q So can a dispersion cone be as large
22 as 360 degrees and as small as, say, 10 degrees?

23 A It really depends on the scene in
24 which this happens.

25 Q But it could be 360 degrees and as

1 Dalley Graff

2 small as 10 degrees?

3 A Certainly. If you have a -- if we're
4 talking about head injuries in particular.
5 Something like a rifle or shotgun to the head where
6 there's nothing blocking anywhere around, then that
7 could actually send tissue 360 degrees around the
8 source.

9 Q What about back splatter? What is
10 that?

11 A Back splatter is when, upon impact of
12 something to a blood source, some of the blood may,
13 in fact, travel back towards the source of the
14 force.

15 Q Did you see any back splatter on the
16 Ford Explorer?

17 A I couldn't say that it was back
18 spatter, but I did see some splatter in the Ford
19 Explorer.

20 Q Now, I think in your report you
21 described the spatter in the Ford Explorer as being
22 I think you said it was consistent with arterial
23 blood; is that right?

24 A I'd have to see where it says that.

25 Q It's Footnote 14. You called it

1 Dalley Graff

2 consistent with a projected pattern, such as a
3 breached artery.

4 A I'm not saying it was a breached
5 artery. I'm just saying it's a projected pattern,
6 and one place that you see that type of pattern is
7 when there's a breached artery. There are other
8 circumstances that can produce similar stain.

9 Q Like a back splatter?

10 A No.

11 Q Okay. So --

12 MR. BUNT: It's 1:20.

13 MR. WHITE: You calling it?

14 MR. BUNT: I'm calling it.

15 MR. WHITE: Okay.

16 MR. BUNT: Just a few very quick
17 questions.

18 EXAMINATION BY MR. BUNT:

19 Q Just first of all, if the vehicles
20 involved in an accident have already been repaired
21 and they have already been cleaned such that any
22 blood spatter, tissue spatter, bloodstains, et
23 cetera, are no longer present, is it common in --
24 is it common for someone such as yourself to rely
25 upon whatever photographic or video evidence there

1 Dalley Graff

2 is of those stains and spatter to make an analysis?

3 A I would say it's common in the
4 bloodstain community to rely on documentation of
5 the original stains, regardless of what happened to
6 the surface afterwards.

7 Q And if the surfaces afterwards just no
8 longer contain those stains and all you have is
9 photographs and videos, is that what you have to
10 rely upon are the photographs and videos?

11 A Yes. I would always rely on the
12 photographs -- photographic or video recordings
13 from the original, even if I were to look at the
14 vehicle itself later.

15 Q But the reason you haven't looked at
16 the vehicles here is because those vehicles have
17 been repaired and cleaned of any stains, correct?

18 A Well, I -- I didn't really consider
19 looking at the vehicles. I haven't had the
20 opportunity to do that other than through the
21 photographic evidence.

22 Q Okay. But sometimes photographs and
23 videos are all you have, correct?

24 A Yes.

25 Q The photographs and videos that you

1 Dalley Graff

2 had here, do you believe that they were of
3 sufficient quality so that when you blew them up --
4 when you enlarged them and put them through your
5 processes with the imaging software you have, you
6 believe they are adequate to support whatever
7 opinions and conclusions you had formed in this
8 case?

9 A Yes. I think they were adequate for
10 the parameters that I used in my conclusions.

11 Q All right. And as to why you haven't
12 reviewed an autopsy report or a pathology report,
13 to your knowledge, was any autopsy report performed
14 on Mr. Santos?

15 A I did request such reports and was
16 advised that they were not available.

17 Q Okay. And as far as any other type of
18 pathology report, something confirming exactly what
19 caused his death, you're not aware that any such
20 reports exists, are you?

21 A I'm still not aware of any. It has
22 not been provided me you.

23 Q As far as you know, what we have are
24 the -- is the testimony of the witnesses that were
25 at the scene, which I guess would include the

1 Dalley Graff

2 police officers and the paramedics, as well as
3 photographs and videos?

4 A I'm not sure I understand the
5 question. My conclusions are based on my
6 observations of what I see in the scene, not
7 relying on anyone -- on any one statement of what
8 they said the injuries were.

9 Q Okay. But when you say "the scene,"
10 you mean the photographs of the scene; correct?

11 A Yes.

12 MR. BUNT: All right. That's all.

13 THE REPORTER: Mr. White, will you be
14 purchasing the original and one?

15 MR. WHITE: Yes.

16 THE REPORTER: And, Mr. Bunt, will you
17 be purchasing a copy?

18 MR. BUNT: Yes, we want a copy. And
19 can you also just give us kind of a rough copy
20 as quickly as you can?

21 THE REPORTER: Yes.

22 * * * * *

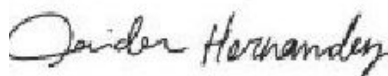
1 STATE OF NEW YORK)
2)SS:
3 COUNTY OF ORANGE)
4

5 I, JAIDEN HERNANDEZ, a Court Reporter and
6 Notary Public within and for the State of New York, do
7 hereby certify:
8

9 That IRIS DALLEY GRAFF, the witness whose
10 deposition is hereinbefore set forth, was duly sworn by
11 me and that such deposition is a true record of the
12 testimony given by the witness.
13

14 I further certify that I am not related to any
15 of the parties to this action by blood or marriage and I
16 am in no way interested in the outcome of this matter.
17

18 IN WITNESS WHEREOF, I have hereunto set my
19 hand this 27th day of December, 2023.
20

21 

22 _____
23 JAIDEN HERNANDEZ
24
25

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Exhibit 1	Scene Reconstruction Report, Bates-stamped 00476.118002323 to 68	6
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Exhibit 3	Spreadsheet of cases, Bates-stamped 00476.118002322	7
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DEFENDANT'S EXHIBITS
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None

ACKNOWLEDGMENT OF DEPONENT

I, IRIS DALLEY GRAFF, do hereby acknowledge I have read and examined the foregoing pages of testimony, and the same is a true, correct and complete transcription of the testimony given by me, and any changes or corrections, if any, appear in the attached errata sheet signed by me.

IRIS DALLEY GRAFF

DATE

Sworn to before me this _____
day of _____, 2023.

X _____
Notary Public

ERRATA SHEET
FOR THE TRANSCRIPT OF:
IRIS DALLEY GRAFF
DECEMBER 14, 2023

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IRIS DALLEY GRAFF

DATE

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EXHIBIT E

IRIS DALLEY GRAFF

Forensic Analyst

Phone 918-470-7876

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SUMMARY

Over 30 years experience in crime scene investigations and forensic biology.

Court-qualified as an expert in crime scene investigation and reconstruction, including bloodstain pattern analysis and shooting incident reconstruction, in U.S District Courts in Oklahoma and Texas, and in State District Courts in Arkansas, California, Colorado, Idaho, Indiana, Kentucky, Virginia, Oklahoma and Texas, and Republic of Kazakhstan

Provided instruction and training in United States, Portugal, France, New Zealand, South Africa and Canada. Also provided remote instruction for Argentina.

EMPLOYMENT

Partner in Graff Investigative and Forensic Training 2016 to present.

Partner in the forensic education and consulting company Bevel, Gardner & Associates, 2008 to 2016.

Oklahoma State Bureau of Investigation 1989 to 2009

Prior to my career in forensic science and law enforcement I was a high school instructor and adjunct professor teaching biology, advanced placement biology, physics and general physical science courses, mathematics, and American Sign Language.

EDUCATION

Master of Arts in Secondary Sciences, 1984, East Central University, Ada. Oklahoma
Bachelor of Science/Biology, 1972, Oklahoma Baptist University

EXPERIENCE

Forensic examination and analysis of crime scenes and items of evidence collected in criminal investigations, particularly crimes of violence and death investigations. Experience includes laboratory analysis, crime scene investigation with emphasis on bloodstain pattern analysis, shooting incident reconstruction, crime scene documentation, evidence identification and collection, forensic animation, and preparation of court exhibits, and training federal, state, and local officers. Laboratory analysis experience includes forensic identification of body fluids, microscopic comparisons, and DNA analysis.

PROFESSIONAL AFFILIATIONS

Scientific Working Group on Bloodstains Pattern Analysis (SWGSTAIN)

Member Spring 2006 to 2012

Ex-Officio 2004-2005

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Association for Crime Scene Reconstruction (ACSR)

Charter Member, Fellow and Distinguished Member
Secretary 1995 to 2009
Board Member 1992-1994

International Association of Bloodstain Pattern Analysts (IABPA)

President 2009-2010
Regional Vice-President 2003 to 2009
Member 1992 to present

International Association of Identification (IAI)

Member, Crime Scene Certification Board 2012-2013
Member, Sub-Committee for Bloodstain Pattern Identification Training, 2007 to 2012
Member 2003 to present

Oklahoma Division of the IAI

Vice-President 2008-2010
Executive Board 2004 to 2008

PROFESSIONAL CERTIFICATIONS

Certified Crime Scene Reconstructionist, IAI, 2011 to 2016
Senior Crime Scene Analyst, IAI, 2003 to 2013
Advanced Law Enforcement Certification, Oklahoma Council on Law Enforcement Education and Training (CLEET), 1996 to 2009
Basic Law Enforcement Certification, CLEET, 1989 to 1996

PROFESSIONAL PRESENTATIONS

Water Closet Drama: Suicide or Homicide	
2019 IABPA European Conference, Pontoise, France	June 20, 2019
Bloodstain Voices From the Field	
2018 IABPA Annual Training Conference, Ottawa, Ontario	Oct 2018
Contextual Bias	
Northeast Division of the International Association of Identification	Dec 2017
Case Study: Crime Scene Reconstruction: Terror in the Night	
Northeast Division of the International Association of Identification	Dec 2017
A Bumpy Road to Justice: Context bias, documentation, and case management	
International Association of Bloodstain Pattern Analysts	Sep 2017
International Association of Identification Annual Conference	Aug 2017
Report Writing for Crime Scene Reconstruction	
Annual ACSR Training Conference, Blackhawk, CO	February 2017
Graphic Investigative Tools in Reconstruction Analysis	
Annual ACSR Training Conference, Nashville, TN	February 2019
IAI 103 rd International Training Conference, San Antonio, TX	July 2018
Annual ACSR Training Conference, Blackhawk, CO	February 2017
Posing the Scene: Animation of Bloodstain Evidence	
Midwest Forensic Science Center Bloodstain Symposium, Ames, Iowa, August 2009	
Homicide or Suicide: Am I My Brother's Keeper	
Oklahoma Division of the IAI, Edmond, Oklahoma,	May 2011
IABPA European Conference, Zurich, Switzerland,	July 2008
Kidnapping by Caesarian-Section	
OK-IAI 2007 Training Conference, Edmond, Oklahoma,	May 23, 2007
2006 IABPA Annual Training Conference, Corning, New York,	October 19, 2006
Terror in the Woods: The Homicides of Charles and Shirley Chick	
IAI 103 rd International Training Conference, San Antonio, TX	July 2018
IABPA European Conference, Middelburg, Netherlands,	February 2006
2005 IABPA Training Conference, Santa Barbara, California,	October 2005

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App. 000491

Sex, Lies, and Cyberspace: The David Howard Homicide

15th Annual International ACSR Training Conference, Albuquerque, NM, February 2006

Lest We Forget: Reconstruction of the Homicide of Oklahoma State Trooper "Rocky" Eales

Annual Training Conference of the Oklahoma Division of the IAI, September 2005

14th Annual International ACSR Training Conference, San Jose, February 2005

Crime Scene Reconstruction

Oklahoma Sheriff's Association Conference, Oklahoma City, 2004

Oklahoma Chiefs of Police Association Conference, Tulsa, 2004

Make My Day: A Reconstruction of the Homicides of Mary Holt and Floyd Roberts

13th Annual International ACSR Training Conference, Oklahoma City, October 2003

2003 IABPA Training Conference, Odessa, Texas, October 2003

A Bite Out of Crime: A Home Invasion and Assault, a Reconstruction

12th Annual International ACSR Training Conference, Denver, Colorado, October 2002

2002 IABPA Training Conference, Harrisburg, Pennsylvania, October 2002.

A Three-Year-Old Hanging Death: A Reconstruction

Annual International ACSR Training Conference, Atlanta, Georgia, 2000

TRAINING INSTRUCTED

40-hour Courses

Advanced Documentation (Bloodstains & Shooting Incidents)

El Cajon, CA	March 9-13, 2020
Chandler, AZ	January 6-10, 2020
Hillsboro, OR	March 11-15, 2019
Bellevue, WA	March 4-8, 2019
Loveland, CO	January 28-February 1, 2019
Houston, TX	January 7-11, 2019
Houston Forensic Resource Center	May 2018, Sept 2018

Death Investigation

Tacoma WA	June 12-16, 2023
Chattanooga, TN	December 5-9, 2022
Minnetonka, MN	October 18-22, 2021
Nashua, NH	January 4-8, 2021
Sanford, FL	December 7-11, 2020
Chattanooga, TN	February 2-7, 2020
Houston, Tx,	April 29-May 3, 2019
Pottawattamie County, IA,	February 11-15, 2019
Houston, TX	January 14-18, 2019
Melbourne, FL	November 26-30, 2018
Fairfax County Police Department	Feb 2018

Shooting Incident Reconstruction

Richlands, WA	June 5-9, 2023
Maysville, NY	October 17-21, 2022
Chubbuck, ID	September 12-16, 2022
Nokesville, VA	April 25-29, 2022
Tacoma, WA	May 16-20, 2022
Littleton, CO	June 6-10, 2022
Clearwater, FL	December 6-10, 2021
Chubbuck, ID	June 21-26, 2021
Andover, MN	May 3-7, 2021
Chattanooga, TN	April 12-16, 2021
Pueblo, CO	March 15-19, 2021
Santa Clara, CA	October 19-23, 2020
Grand Junction, CO	October 5-9, 2020
North Las Vegas, NV	January 13-17, 2020

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Windsor, Ontario	October 7-11, 2019
Dover, NH	September 23-27, 2019
O'Fallon, MO	Sept 9-13, 2019
Boynton Beach, FL	June 3-7, 2019
Appleton WI	May 6-10, 2019
Johnson County, KS	April 1-5, 2019
Everette, WA	March 18-22, 2019
Edinburgh, IN	October 29-November 2, 2018
O'Fallon, MO	October 15-19, 2018
Madison, WI	June 2018
Ottawa, Ontario Canada	April 2018
Lander, WY	May 2017
Wauwatosa, WI	May 2017
New York City, NY,	May 2016
Long Beach, California,	April 2016
Madison, Wisconsin,	August 2015
Waco, Texas,	July 2015
Grand Junction, Colorado,	November 2014
Greenfield, Indiana,	August 2014
Austin, Texas	July 2014
Farmington, New Mexico	June 2014
Austin, Texas	May 2014
Pueblo, Colorado,	October 2013
Omaha, Nebraska,	June 2013
Loveland, Colorado,	August 2012
Grand Junction, Colorado,	June 2012
Norman, Oklahoma,	October 2011
Phoenix, Arizona,	October 2010
Pueblo Colorado,	July 2009
Advanced Crime Scene Reconstruction	
Conroe, Texas,	June 2016
Grand Junction, Colorado,	August 2015
Fort Collins, Colorado,	August 2011
Flower Mounds, Texas,	August 2012
San Diego, California,	May 2012
Phoenix, Arizona,	September 2011
Denver, Colorado,	June 2011
Crockett, Texas,	December 2010
Norman, Oklahoma,	October 2009
Eugene, Oregon,	February 2009
Crime Scene Reconstruction	
Charlotte, TN	March 20-24, 2023
O'Fallon, MO	March 13-17, 2023
Andover, MN	February 6-12, 2023
Vancouver, WA	May 23-27, 2022
Centennial, CO	January 10-14, 2022
St Louis, MO	October 14-18, 2019
Fairfax, VA	September 16-20, 2019
Madison, WI	May 13-17, 2019
Nashville, TN	April 8-12, 2019
Clearwater, FL	December 3-7, 2018
St Louis, MO	July 2018
Dover, NH	May 2018
St Louis, MO	August 2017
Beaver County, PA	March 2017

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Lauderhill, Florida,	November 2016
St Louis, Missouri,	August 2016
Boston MA	July 2016
San Diego, California,	June 2016
Conroe, Texas,	February 2013, February 2015
Austin, Texas,	July 2013
Plano, Texas,	September 2012
Wichita Falls, Texas,	August 2011
Lansing, Michigan,	June 2011
Phoenix, Arizona,	August 2011, May 2010
Advanced Bloodstain Pattern Analysis	(40 hour)
Silverton, South Africa,	July 2015
Baton Rouge, Louisiana	October 2014
Baton Rouge, Louisiana	April 2014
Midwest City, Oklahoma,	July 2013
Galveston, Texas,	January 2011
Conroe, Texas,	November 2009
Basic Bloodstain Pattern Analysis	(40 hour/course)
Arlington, VA	April 17-21, 2023
Charlotte, TN	February 28 - March 4, 2022
Nashua, NH	October 4-8, 2021
Centennial, CO	June 14-18, 2021
Grand Junction, CO	March 30-April 3, 2020
St Louis, MO	October 21-25, 2019
Edinburgh, IN	November 5-9, 2018
St Louis, MO	October 22-26, 2018
Alexandria, VA	June 2018
San Diego, California,	May 2016
New York City, NY,	April 2016
Denton, Texas,	February 2016
Wichita, Kansas,	November & December 2015
Silverton, South Africa,	July 2015
Denton, Texas,	April 2015
Fort Gillem, Georgia	January 2015
Baton Rouge, Louisiana	August 2014
Baton Rouge, Louisiana	February 2014
Austin, Texas,	May 2013
Amarillo, Texas,	April 2012
Houston, Texas,	March 2011
El Paso, Texas.	January 2011
Broken Arrow, Oklahoma,	April 2010
Lubbock, Texas,	January 2010
Wichita Falls, Texas.	April 2009
Grand Junction Colorado,	December 2008
Phoenix, Arizona,	November 2008
16-32 hour Courses:	
Essentials of Criminal Investigations	(24 hr/course)
St Louis, Missouri	August 2017
Chickasaw Lighthorse Police, Ada, OK	May 2017 and June 1017
Broken Arrow, Oklahoma,	January 2017
St Louis, Missouri	August 2016
Broken Arrow, Oklahoma,	August 2016
St Paul, Minnesota,	April 2015
Marshalltown, Iowa,	December 2014
Austin, Texas	June 2014 and July 2014

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St Paul, Minnesota,	June 2014	
Shawnee, Oklahoma	March 2014	
Ada, Oklahoma,	2013	
Forensic Biology (guest lecturer)		
Otago University Summer School (Dunedin, New Zealand)	February 2013 and January 2012	
Documenting Bloodstain Pattern Evidence		(32 hour)
Sirchie, Raleigh, NC,	May 2011	
Homicide Investigation	Southern Police Institute	(16 hour)
Rockford, Illinois	November 2013	
St Paul, Minnesota	October 2013	
Sioux Falls, South Dakota	April 2013	
Colorado Springs,	June 2012	
Havanna, Florida,	May 2012	
Cedar Rapids, Iowa,	October 2011	
Mundelien, Illinois,	September 2011	
Louisville, Kentucky,	January 2013, June 2013, June 2012, February 2011	
Bloodstain Pattern Analysis and Stain Selection for DNA Analysts (24 hour)		
Colorado Bureau of Investigation,	March 2010	
Workshops		
Shooting Incident Reconstruction Workshop		(8 hour)
Annual ACSR Training Conference, Blackhawk, CO	February 2017	
Crime Scene Documentation: Scene Mapping		(8 hour)
Norman Police Department,	October 26, 2007	
Introduction to Bloodstain Pattern Analysis		(8 hour/course)
CLEET Criminal Investigation Academy		
Tulsa Police Academy	May 2006	
McAlester, Oklahoma	2005	
Lawton, Oklahoma	2004	
Search Warrants: Acquisition & Execution		(8 hour/course)
Sponsored by Federal Bureau of Investigation and Oklahoma State Bureau of Investigation		
Hugo, Oklahoma	November 2005	
Poteau, Oklahoma	November 2001	
Crime Scene Reconstruction		(8 hour)
Federal Bureau of Investigation and Bureau of Indian Affairs, Phoenix, AZ	January 2004	
Major Crime, Securing the Scene and Crime Scene Processing		(8 hour)
Tribal/BIA Uniformed Police Officer In-Service Training Program,	July 1996	
Crime Scene Processing/Evidence Collection		(8 hour)
C.L.E.E.T. Basic Academy,	1993	
Bloodstain Pattern Recognition Workshop		(4 hour/conf)
IAI 103 nd International Training Conference, San Antonio, TX	July 2018	
IAI 102 nd International Training Conference, Atlanta, GA	Aug 2017	
IAI 98 th International Training Conference, Providence Rhode Island		
IAI 97 th International Training Conference, Phoenix, Arizona,	July 2012	
IAI 96 th International Training Conference, Milwaukee, Wisconsin,	August, 2011	
IAI 95 th International Training Conference, Spokane, Washington,	July 2010	
IAI 94 th International Training Conference, Tampa, Florida,	August 2009	
IAI 93 rd International Training Conference, Louisville, Kentucky,	July 2008	
IAI 92 nd International Training Conference, San Diego, California,	July 2007	
Bloodstain Reconstruction Workshop		(4 hr)
Annual ACSR Training Conference, Nashville, TN	February 2019	
2018 IABPA Annual Training Conference, Ottawa, Ontario	Oct 2018	
IAI 103 nd International Training Conference, San Antonio, TX	July 2018	

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Trajectory Analysis Workshop	(4 hr/course)
Northeast Division of the IAI	Dec 2017
Bloodstain Pattern Identification Workshop	(4 hr/course)
Northeast Division of the IAI	Dec 2017
Posing the Scene: Forensic Animation Workshops	(4 hour/conf)
2015 ACSR Annual Training Conference	
2011 IAI 96 th International Training Conference, Milwaukee, Wisconsin	
2010 European IABPA Conference, Lisbon, Portugal	
2009 IABPA Conference, Portland, Oregon	
2009 18th Annual International ACSR Training Conference, Tulsa, Oklahoma	
2008 17th Annual International ACSR Training Conference, Tulsa, Oklahoma	
Bloody Bones and Butcher Knives: Bloodstain Pattern Recognition	(4 hour)
Annual Training Conference of the Oklahoma Division of the IAI	September 2005
Crime Scene Documentation Workshop: Measurements to Courtroom Exhibits	(4 hour)
Oklahoma Division of the IAI Annual Training Conference, Edmond, Oklahoma,	September 2005
Evidence Collection and Preservation Workshop	(4 hour)
Oklahoma Division of the IAI Annual Training Conference, Edmond, Oklahoma	September 2005
Building a Case Presentation: PowerPoint for Courtroom Presentation Workshop	(4 hour)
14 th Annual International ACSR Training Conference, San Jose, February 2005	
Crime Scene Diagramming	(4 hour)
OSBI Academy,	September 2002
After the Report: Bloodstain Models for Training and Testimony	(2 hour/conf)
IAI 98 th International Training Conference, Providence Rhode Island	
IAI 94 th International Training Conference, Tampa, Florida, August 2009	
Animations in Reconstruction	(2 hour/course)
Advanced Crime Scene Reconstruction, sponsored by TBI, LLC	
Norman, Oklahoma,	2008
Norman, Oklahoma,	2007
Norman, Oklahoma,	2005

SPECIALIZED TRAINING ATTENDED

Fluid Dynamics of Bloodstain Pattern Formation, Pontoise, France	June 2019
	(40 Hrs)
International Association of Identification, Annual Conference,	August, 2016
Trajectories, Rods and lasers	(4 hrs)
Bloodstains on Fabrics and the use of an ALS	(3 hrs)
Analysis of Complex patterns and BPA scenarios	(4 hrs)
Applying Bloodstain Pattern Analysis Methodology to Casework	(3 hrs)
Distinguishing Human from Non-Human Skeletal Remains	(3 hrs)
Examination of Bloodstains and Bloodstain Patterns on Clothing	(4.5 hrs)
The Basics of Bone Trauma	
Wipes, Swipes and Transfer Impressions	
Recognizing Voids and How To Use Them In Bloodstain Pattern Analysis	
Criminal Profiling from an Investigator's Perspective	
Bloodstain Symposium, Midwest Forensic Science Center,	August 2010
	20 hours
IABPA European Training Conference	24 hours/year
2006, 2008, 2010, 2019	
IABPA Annual Training Conferences	24 hours/year
1992, 1994, 1995, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009,	
2010, 2015, 2017, 2018	
ACSR Annual Training Conference	
1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003,	

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2004, 2005, 2006, 207, 2008, 2009, 2010, 2011, 2015, 2016, 2017, 2019, 2020

Bloodstain Pattern Analysis Level III 50 hours
Henderson Forensics, instructor Bob Henderson, Canyon, Texas November 2005

Forensic Shooting Scene Reconstruction 40 hours
Instructors Joe Foster and Mike Haag, Los Lumas, New Mexico June 2004

Homicide Investigations 80 hours/course
Southern Police Institute/OSBI Oklahoma City September 2002
Southern Police Institute/OSBI, Oklahoma City May 1991

OSBI 12th Investigative Academy, Oklahoma City February 2002

Microscopic Hair Analysis OSBI, Oklahoma City, January 2000 40 hours

Crime Scene Reconstruction
Oklahoma City, 1994 16 hours
Oklahoma City, 1993 16 hours
Oklahoma Sheriff's and Peace Officer's Association (OSPOA), 1995 4 hours

Biochemistry East Central University, Ada, Oklahoma, 1998

Photography OSBI, December 1997

Advanced Bloodstain Pattern Analysis 40 hours
Kansas Bureau of Investigation, October 1996

Basic Molecular Biology University of Oklahoma, 1995

DNA Analysis
OSBI & District Attorney's Council, Fort Worth, November 1995 16 hours

Forensic PCR Amplification & Typing
OSBI and Perkin-Elmer, November 1995 54 hours

DNA: Proving the Truth OSBI 1995 16 hours

Oklahoma Women in Law Enforcement Training Conference, 1995 8 hours

Forensic Pathology OSBI, 1994 4 hours

Investigations of Crime: Crime Scenes, Computers, and Children, 20 hours
Center for Medicolegal Research, Albuquerque, New Mexico May 1994

Child Sexual Abuse, Infant & Child Fatalities 16 hours
Oklahoma Department of Health, 1994

Southwestern Association of Forensic Science/Southern Association of Forensic Science Joint Conference
Little Rock, AR, 1994 24 hours
Crime Scene Photography, SWAFS 1994 4 hours

Shreveport, Louisiana, 1992 24 hours
Advanced Crime Scene Processing 8 hours

Investigating Child Fatalities Tulsa, 1994 16 hours

Forensic Serology FBI, Quantico, Virginia, June 1993 40 hours

CLEET Criminal Investigation Academy 124 hours
Wilburton, Oklahoma. February-March 1993

Southwestern Association of Forensic Science/Southern Association of Forensic Science Joint Conference, Shreveport, LA, 1992
Advanced Crime Scene Processing 8 hours
Basic Serology, SWAFS 1992 8 hours

Southwestern Association of Forensic Science Annual Training Conference 1991
16 hours

Advanced Bloodstain Pattern Analysis 40 hours
OSBI, Oklahoma City, January 1992

Semi-Automatic Pistol Transition School, Oklahoma Highway Patrol, 1992 24 hours

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OSBI 9 th Academy	Oklahoma City, 1991	300 hours
Basic Bloodstain Pattern Analysis	OSBI, Oklahoma City, April 1991	40 hours
Luminol, OSBI	1991	16 hours
CLEET Basic Academy,	Broken Arrow, Oklahoma, 1989	300 hours

MEDIA

48 Hours: <i>Death Hits Home</i>	2022
Forensics: You Decide: <i>Blood Brothers</i>	
Investigation Discovery, a Sirens Media production,	2009
Swift Justice with Nancy Grace CBS Studios, Inc.,	2010

PUBLICATION

Developing and Using Demonstrative Exhibits in Support of the Crime Scene Analysis
Practical Crime Scene Analysis and Reconstruction, CRC Press, Boca Raton, Florida,
p. 249-271

AWARDS

Oklahoma Division of the IAI Lifetime Membership	2016
Distinguished Fellow of the ASCR	2011
Fellow of the ACSR	2003
Oklahoma State Bureau of Investigation Criminalist of the Year	1995

EXHIBIT F

RE: United States Civil Action No. 3:22-CV-02714-K

SCENE RECONSTRUCTION ANALYSIS REPORT

Iris Dalley

Graff Investigative & Forensic Training

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GRAFF Investigative & Forensic Training

Re: United States Civil Action No. 3:22-CV-02714-K

Estate of Nehemias R. Pivaral Santos v. Caylee Erin Smith and Eastman Chemical Company

An analysis and reconstruction were conducted to determine the sequence of actions that occurred in the death of Nehemias R. Pivaral Santos. This analysis used a structured methodology of bloodstain pattern analysis and scene reconstruction. Bloodstain pattern¹ analysis is the application of fluid dynamics as it relates to bloodstain characteristics, accomplished by in-depth examination of documentation such as images. Reconstruction identifies relationships between various types of evidence in the context of the scene to identify actions that occurred to produce the evidence, to sequence those actions, and to include or exclude scenarios consistent with the evidence.

The analyst's opinions are based on the analyst's experience, education, and training. The explained events are based on the available evidence. The analyst will consider additional evidence that becomes available, and the analyst may revise portions of the analysis based on the relevance of additional evidence.

The following information was provided to the analyst:

- Richland PD Photos – 3 pdf documents containing 57 scene images.
- TX DPS Photos – 43 jpg files (DSC_0001 thru DSC_0033 and IMG_1397 thru IMG_1406)
- Bodycam Richland PD Corp. Winston mp4 video files RPD003_8L005577_160346, RPD003_8L005577_161348, RPD003_8L005577_162348, and RPD003_8L005577_164348
- TX DPS Troop. Sherman video file JosephSherman_20220430_03_59_WFC1-067751_Traffic Crash_188473525.ts
- Richland Police Department Incident Report #2200089
- Richland PD Caylee Smith Statement
- Richland PD Evelyn Moreno Statement
- Texas Department of Transportation Peace Officer's Crash Report 2200089
- State of Texas Certificate of Death Nehemias R Pivaral Santos
- Excerpt of Deposition of Caylee Erin Smith, August 8, 2023
- Excerpt of Deposition Evelyn Moreno, August 2, 2023
- Excerpt of Deposition Erick Jeremias Pivaral Santos, August 1, 2023
- Excerpt of Deposition Melvin Alexander Diaz Fuentes, August 2, 2023

HISTORY²

On April 30, 2022, Richland police were dispatched to a reported traffic accident with fatality. The scene location was "near the 223-224 North Interstate 45"³. Reports at the scene indicated

¹ A bloodstain pattern is one or more related bloodstains created by a single action.

² Richland Police Department Incident Report #2200089.

³ Ibid p2

Nehemias Santos and Evelyn Morena were outside their 2011 Toyota Camry, parked partially in the roadway, when Nehemias was struck by a passing vehicle driven by Caylee Smith.

SCENE

The scene was the left northbound lane of Interstate 45 about 1 mile south of Exit 225.⁴

Figure 1. A black 2011 Toyota Camry was parked astride the left boundary of the northbound lane. The trunk lid was fully open. A tire was standing against the left barrier near the left front of the Camry. *Figure 2.*⁵

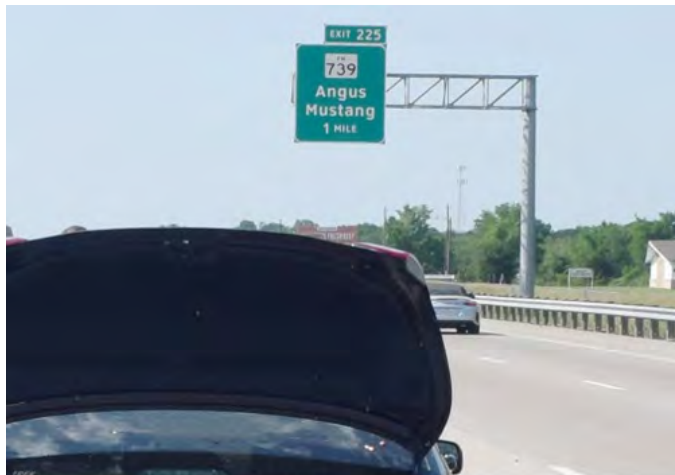


FIGURE 1. TX DPS DSC_0014



FIGURE 2. Richland PD Photos 2200089 - Photos_Part2_17

Nehemias Santos' body was lying supine on the pavement behind the Camry. His head was to the west and his legs to the east. Nehemias was dressed in a dark short-sleeved shirt, dark long pants, and dark socks. A light-colored cloth was against the right side of Nehemias' head. *Figure 3.*

⁴ Satellite view of google.com/maps for I-45 Exit 225 area was used as the base of the scene model.

⁵ Richland Police Department Incident Report #2200089 p.2, the family covered the body after Richland PD Officer Winston's arrival.



FIGURE 3. Bodycam RPD003_8L00577_160346 00.04

A wide path of blood/fluid staining was on the pavement approximately parallel to Nehemias Santos' left side and extended to the east side of the northbound lane, east of the Camry. Apparent body tissue⁶ and debris of varying sizes was on the pavement and Camry. A drag-like mark on the pavement extended from Nehemias Santos' right foot to the east end of the blood/fluid staining.

The cause of death was reported as blunt force trauma⁷. No medical evaluation of Nehemias Santos' injuries were provided

to the analyst. Bloodstains near the head and the tissue debris indicated open head trauma. The right leg appeared bent in an unnatural position, possibly indicative of a broken leg.⁸



FIGURE 4. TX DPS DSC_0012 Bloodstains on barrier.

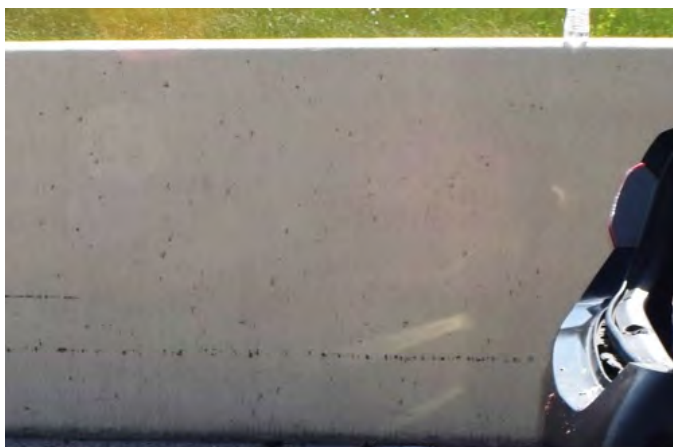


FIGURE 5. TX DPS DSC_0012

Circular and elliptical bloodstains on barrier.

A pattern of circular and elliptical bloodstains was on the east side of the center concrete barrier west of the body and rear portion of the Camry. *Figure 4*. The bloodstains were mostly circular⁹, indicating the blood drops were moving east-to-west, approximately perpendicular to the

⁶ For purposes of this report "tissue" refers to masses that appear to be comprised of cerebral material, body fat, and body fluid.

⁷ State of Texas Certificate of Death Nehemias R. Pivaral Santos

⁸ Richland Police Department Incident Report #2200089 p.2 stated the "right leg was obviously broken" without explanation. The body was only documented by the Richland PD bodycam from a distant obtuse angle for about 6 seconds.

⁹ Blood in flight forms spherical drops that produce circular to elliptical stains. The shape of individual stains is related to the angle of impact to the target surface. The direction of flight can be determined by the direction of the movement of blood after impact, or the 'tails' of the stain.

barrier. The overall distribution of stains radiated slightly to the south with no void areas within the broad pattern on the barrier.¹⁰ No obstacles were between the blood source and the barrier pattern area. *Figure 5 and Figure 6*. The pattern on the barrier continued west of the open Camry trunk. *Figure 7*.



FIGURE 6. Two views of bloodstains on barrier.

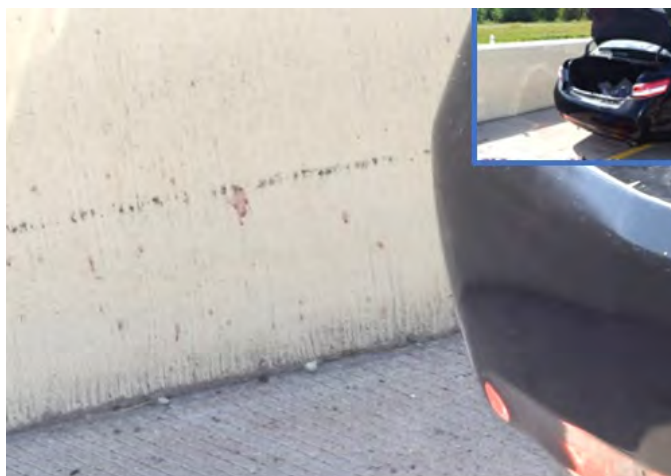


FIGURE 7. TX DPS DSC_0023. Blood on barrier west of car.

Elliptical stains, some with associated flow, were along the west side of the Camry, from the trunk opening downward. Directionality of these stains was east-to-west. Blood could be seen in some of those stains. Elliptical stains and tissue debris were across rear window. *Figure 8*. The shape and location of these stains indicated a source east of the trunk.



FIGURE 8. TX DPS DSC_0017. Stains on west side of Camry.



FIGURE 9. TX DPS DSC_0023. Stains on rear of Camry.

¹⁰ Void in a bloodstain pattern occurs when a portion of a pattern is removed. For example, if an obstacle had obstructed the path of the blood to the barrier, then the pattern would have an absence of blood within the pattern area that reflected the obstacle shape. That portion of the bloodstain pattern would be on the obstacle's surface.

Elliptical bloodstains were on the vertical surface of the left rear taillight housing. The outline of blood stains originated from a source east of the taillight housing and were travelling downward when they contacted the taillight housing¹¹. *Figure 9*.

Tissue debris, consistent with cerebral matter, was concentrated around the east side of the rear bumper, east edges of the trunk, and across the rear glass. *Figure 10*. Similar debris was notably absent from the trunk interior.¹² *Figure 11*.



FIGURE 10. TX DPS DSC_0017. Tissue debris around trunk.

Tissue debris marked.



FIGURE 11. TX DPS DSC_00. Rear of Camry.

Tissue masses were on the pavement below the right side of the Camry and forward of the right rear tire. *Figure 12*.



FIGURE 12. TX DPS DSC_0023. Rear of Camry.

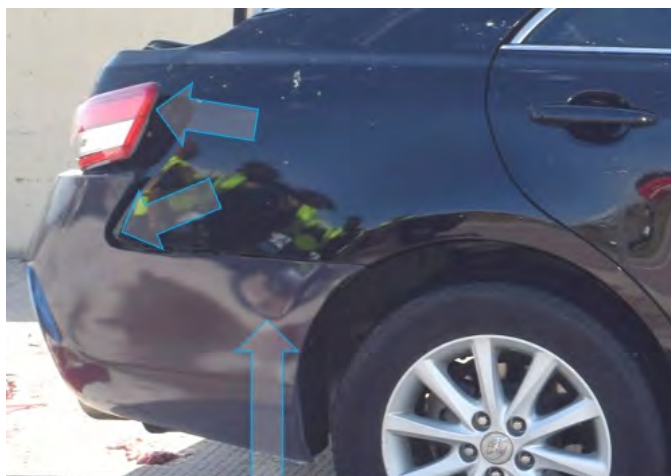


FIGURE 13. TX DPS DSC_0011. Right side of Camry.

The right rear taillight lens cover was broken. Pieces of the lens cover were on the pavement behind the Camry and east of the Camry. *Figure 12*. The right end of the rear bumper had a

¹¹ Blood drop flights are parabolic. At some point gravity will cause the flight path to turn downward.

¹² TX DPS DSC_0023 trunk interior trunk color adjusted to enhance view.

downward and backward depression. The bumper was separated from the right rear quarter panel at the back end of the quarter panel. The right side of the taillight assembly was dislocated backward. *Figure 13.*

Tissue spatter was dispersed across the right side of the Camry from the rear to the right front window, and across the right roof of the Camry. One tissue mass was adhered to the back edge of the rear side window frame (yellow outlined arrow in figure). *Figure 14.* This dispersion pattern was consistent with a source south and east of the Camry right side.

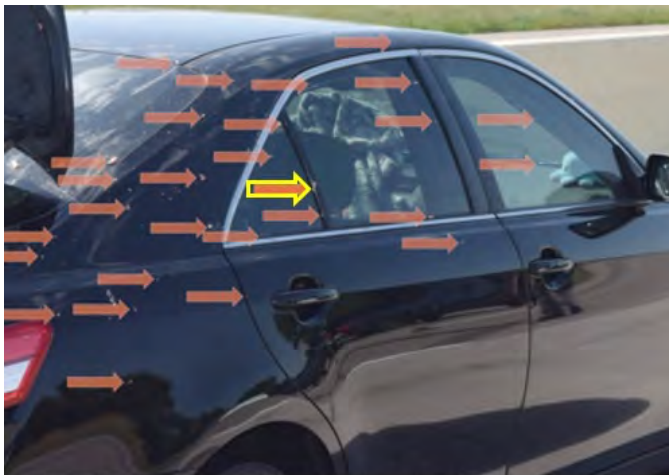


FIGURE 14. TX DPS DSC_0023. Right side of Camry.

A white 2021 Ford Explorer was parked in the left emergency lane north of the Camry.¹³ The left front headlight was broken. The top front of the left quarter panel was bent backward, exposing the left front side of the engine compartment. *Figure 15.*



FIGURE 15. TX DPS IMG_1406 Ford Explorer.

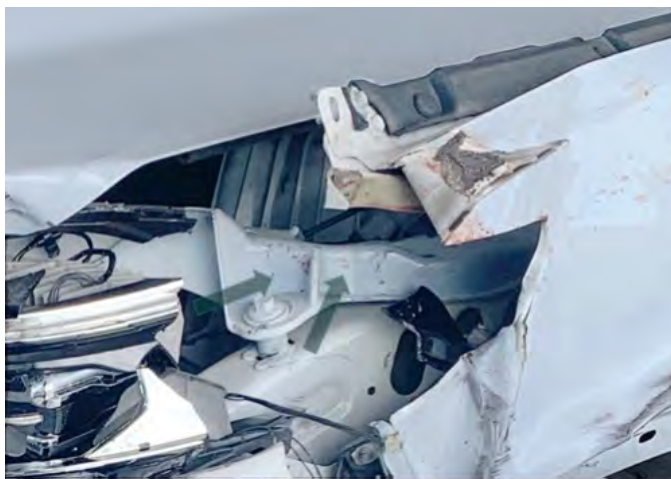


FIGURE 16. TX DPS IMG_1406 Ford Explorer.

¹³ Richland Police Department Incident Report #2200089 p.2 and bodycam video RPD003_8L00577_162348 0.335

Circular and elliptical bloodstains were inside the defect area¹⁴. *Figure 16*. Elliptical stains¹⁵ were on the bent metal and above the right front tire. Swipe-like bloodstains were along the left side rear door. The left front fender trim was separated from the fender. The front of the left rear fender trim was dislodged. *Figure 17*.



FIGURE 17. Richland PD 2200089 - Photos_Part1_9



FIGURE 18. TX DPS IMG_1405 Ford Explorer.

The driver's side mirror was not damaged. *Figure 18*. Nehemias Santos was not struck by the Explorer side mirror.

No bloodstains, dents or pressure marks were on the Explorer hood, indicating that Nehemias Santos was not carried forward on the Explorer hood.



FIGURE 19. Approximation of Nehemias Santos' posture.

In the context of this scene, if the Explorer damage was caused by an impact with Nehemias Santos' head, then Nehemias Santos' head was lowered to the level of the Explorer headlight.¹⁶ The exact posture cannot be determined but requires flexing of the lower joints (hips and/or knees). The posture depicted is an approximation to lower the head to the impact level.

Figure 19.

¹⁴ The volume in stains within the defect area was consistent with a projected pattern, such as a breached artery.

¹⁵ Elliptical bloodstains immediately behind the metal defect appear to be a complex pattern of impact spatter and projected blood. A complex bloodstain pattern occurs when bloodstain patterns overlap.

¹⁶ Vehicles in scene model dimensioned to manufacturer's specifications. Generic male model for demonstrative purposes only.

At impact, an opening was created behind the Explorer's left headlight, and blood was projected into the engine compartment. *Figure 16.*

The impact scattered blood from Nehemias Santos to the east side of the barrier. *Figures 4-8.* The bloodstain impact spatter pattern¹⁷ extended north of the back end of the Camry. No physical contact between the two vehicles was evidenced. Therefore, the initial impact occurred east of the Camry right rear, in the northbound driving lane, near the Camry right rear. *Figure 20, Figure 21.*

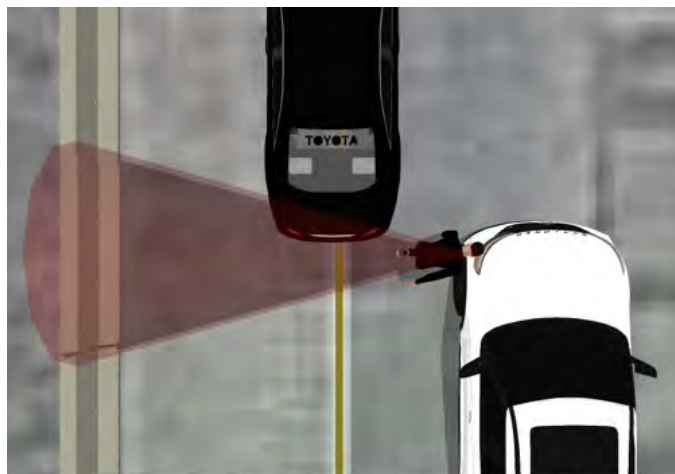
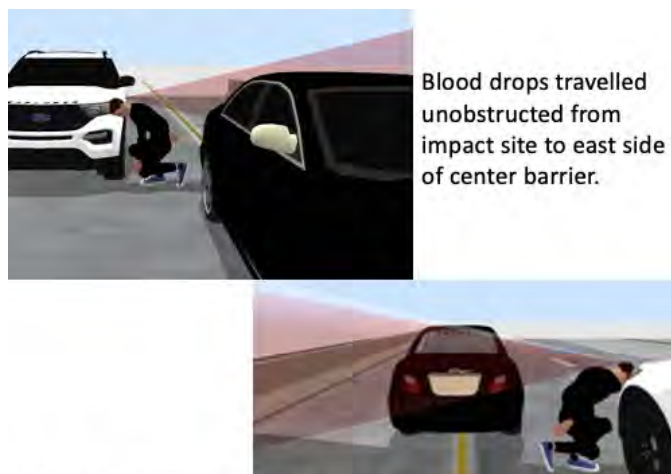


FIGURE 20. Cone indicating blood impact spatter to barrier.



Blood drops travelled unobstructed from impact site to east side of center barrier.

FIGURE 21. Cone indicating blood impact spatter to barrier.

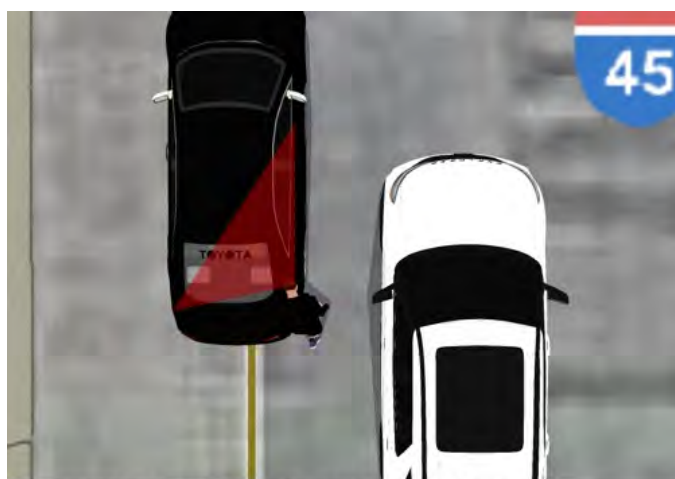


FIGURE 22. Body hit Camry, cone area of blood/tissue.

Blood was swiped from a bloodied surface to the Explorer above the left front tire.

Nehemias Santos impacted the area of the Camry right-side bumper, displacing the bumper and breaking the taillight lens cover. This impact ejected blood and tissue across the trunk, rear window, roof, and right side of the Camry. *Figures 9-15, Figure 22.*

Nehemias Santos body moved, or rebounded, from the Camry to the left side of the Explorer such that his body was in hard contact with the left side of the Explorer as the Explorer continued moving north. This

¹⁷ A bloodstain impact pattern occurs when a force is applied to a blood source. Blood is propelled from the source in an approximate cone area from the source to the target surface, creating a radiating distribution of circular to elliptical stains. With sufficient documentation the area of origin of the bloodstains can be calculated to identify the approximate location of the blood source. In this case, the source can be approximated by the overall barrier pattern and its relationship to other evidence in the scene.

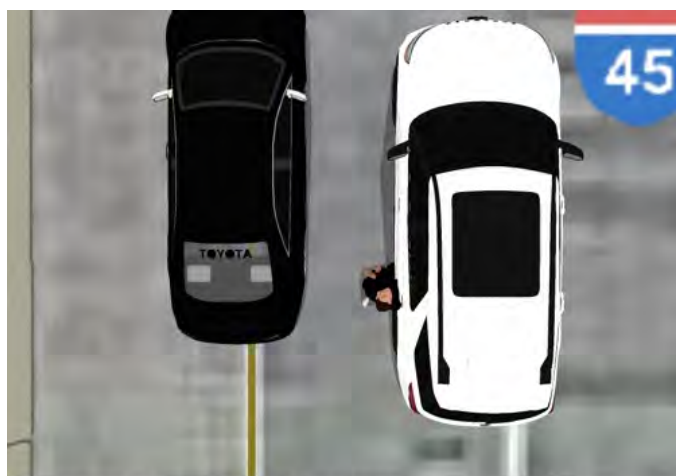


FIGURE 23. Body hit Explorer, blood swipe on Explorer.

contact created blood swipes¹⁸ along the left side of the Explorer, along the left rear door. The movement of the Explorer against Nehemias Santos body displaced the front trim of the left rear fender. *Figure 17, Figure 23.*

Nehemias Santos' body fell to the pavement in the northbound traffic lane. A pool of blood on the pavement was consistent with originating from Nehemias Santos' head trauma. *Figure 24, Figure 25.*



FIGURE 24. TX DPS DSC_0011. Blood pool on roadway.



FIGURE 25. Body fell to pavement, blood pooled from head.



FIGURE 26. Body dragged behind Camry.

¹⁸ Blood swipe stains occur when a bloodied object moves against a surface, leaving a portion of the blood on that surface.

Some person(s) dragged Nehemias Santos' body from the roadway to the pavement behind the Camry.¹⁹ *Figure 26.*



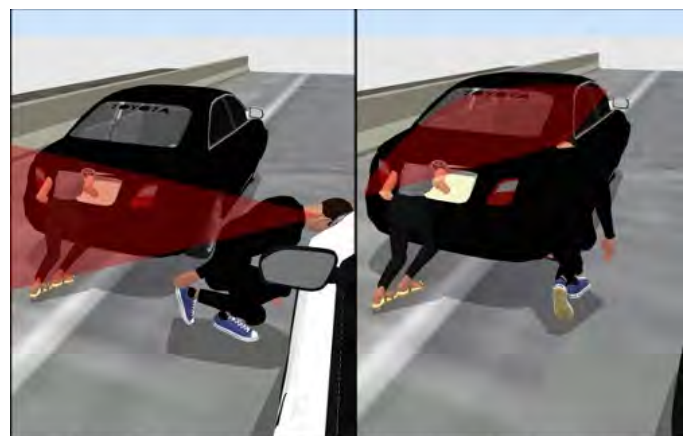
FIGURE 27. RPD003_8L00577_164348 8.38.

Evelyn Moreno, Erick Pivaral, Melvin Diaz, and Dina Regalado were at the scene.²⁰ *Figure 27-28.*

Bodycam images of Evelyn Moreno showed that she had blood spatter and tissue spatter on her right arm and on her right side. *Figure 28.* Evelyn Moreno's right side was exposed to blood and tissue as it traveled through the air from the source to her. In the context of the scene, an area of possible spatter void was identified in the Camry trunk. Moreno could have been positioned behind the Camry at the left side of the trunk, leaning into the trunk, when the impact occurred. *Figure 29.*



FIGURE 28. Bodycam images of Evelyn Moreno at scene.



Shaded area indicating approximate path of spatter.
FIGURE 29. Scenarios with Moreno in Camry trunk at impact.

¹⁹ The position of the body on the pavement behind the Camry suggests he may have been dragged by his right arm, causing his left arm and legs to be extended. Then his right arm was placed across his body.

²⁰ Richland Police Department Incident Report #2200089.



FIGURE 30. Bodycam images of Eric Pivaral at scene.

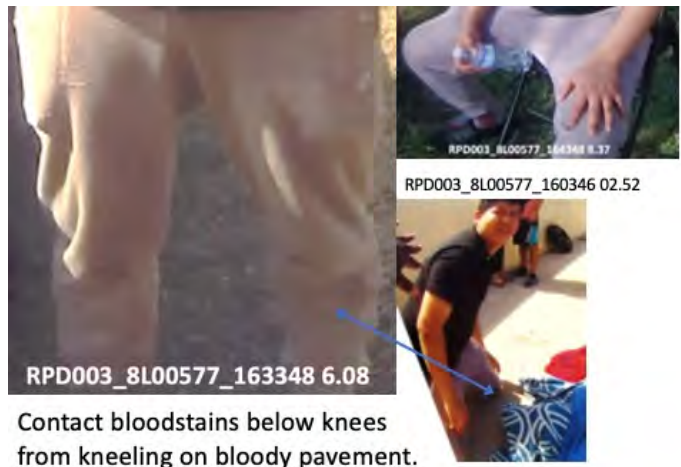


FIGURE 31. Bodycam images of Eric Pivaral at scene.

Bodycam images of Erick Pivaral showed no indications of bloodspatter or tissue debris on his shirt, arms, or pants.²¹ *Figure 30, Figure 31.* Erick Pivaral was not in the path of blood and tissue spatter at impact. Erick Pivaral was not standing at the Camry trunk or east of the barrier bloodstain pattern area at the time of impact.



FIGURE 32. Bodycam images of Melvin Diaz at scene.



FIGURE 33. Bodycam images of Dina Regalado at scene.

Bodycam images of Melvin Diaz showed no indications of bloodspatter or tissue debris on his shirt or arms. *Figure 32.* Melvin Diaz was not in the path of blood and tissue spatter at impact. Melvin Diaz was not standing at the Camry trunk or east of the barrier bloodstain pattern area at the time of impact.

²¹ A possible transfer stain was on Erick Pivaral's left lower pant leg, below the left knee. This pattern could occur from kneeling on the stained pavement as depicted in the bodycam video RPD003_8L00577_160346 02.52. This stain is not consistent with being in the path of blood in flight such as the impact pattern on the barrier.

Bodycam images of Dina Regalado showed no indications of bloodspatter or tissue debris on her shirt or arms. *Figure 33*. Dina Regalado was not in the path of blood and tissue spatter at impact. Dina Regalado was not standing at the Camry trunk or east of the barrier bloodstain pattern area at the time of impact.

CONCLUSIONS

Based on analysis of the documents, images, and video, the following sequence of actions was identified:

Nehemias Santos was in the left northbound traffic lane, near the right rear of the Camry and east of the Camry, when he was struck by the front left of the Explorer which was travelling in the northbound travel lane.

The force of impact with the Explorer caused blood to be projected from Nehemias Santos to the center barrier, creating a large spatter pattern on the barrier. No intervening objects or persons were in the path of the blood as it travelled from Nehemias Santos to the barrier.

The force of impact with the Explorer propelled Nehemias Santos' body against the right side of the Camry rear bumper, damaging the right taillight and bumper, and projecting blood and tissue from Nehemias Santos across the Camry open trunk and right side.

Nehemias Santos' body rebounded from the rear of the Camry and came in hard contact with the Explorer left side, leaving blood swipes on the Explorer left rear door and dislodging the front section of the left rear fender trim.

Nehemias Santos' body fell to the pavement east of the Camry, in the northbound traffic lane. Blood from Nehemias Santos' head trauma pooled on the pavement.

During these events, Evelyn Moreno was behind the Camry at the left side of the open trunk. Nehemias Santos' blood and tissue struck Evelyn Moreno's right side.

Someone dragged Nehemias Santos' body from the northbound traffic land to the pavement behind the Camry.

Respectfully submitted,



Iris Dalley Graff

28 September 2023

Reviewed by Gary Graff.



FIGURE 1. TX DPS DSC_0014

00476.118002336

App. 000513



FIGURE 2. Richland PD Photos 2200089 - Photos_Part2_17

00476.118002337

App. 000514



FIGURE 3. Bodycam RPD003_8L00577_160346 00.04

00476.118002338

App. 000515

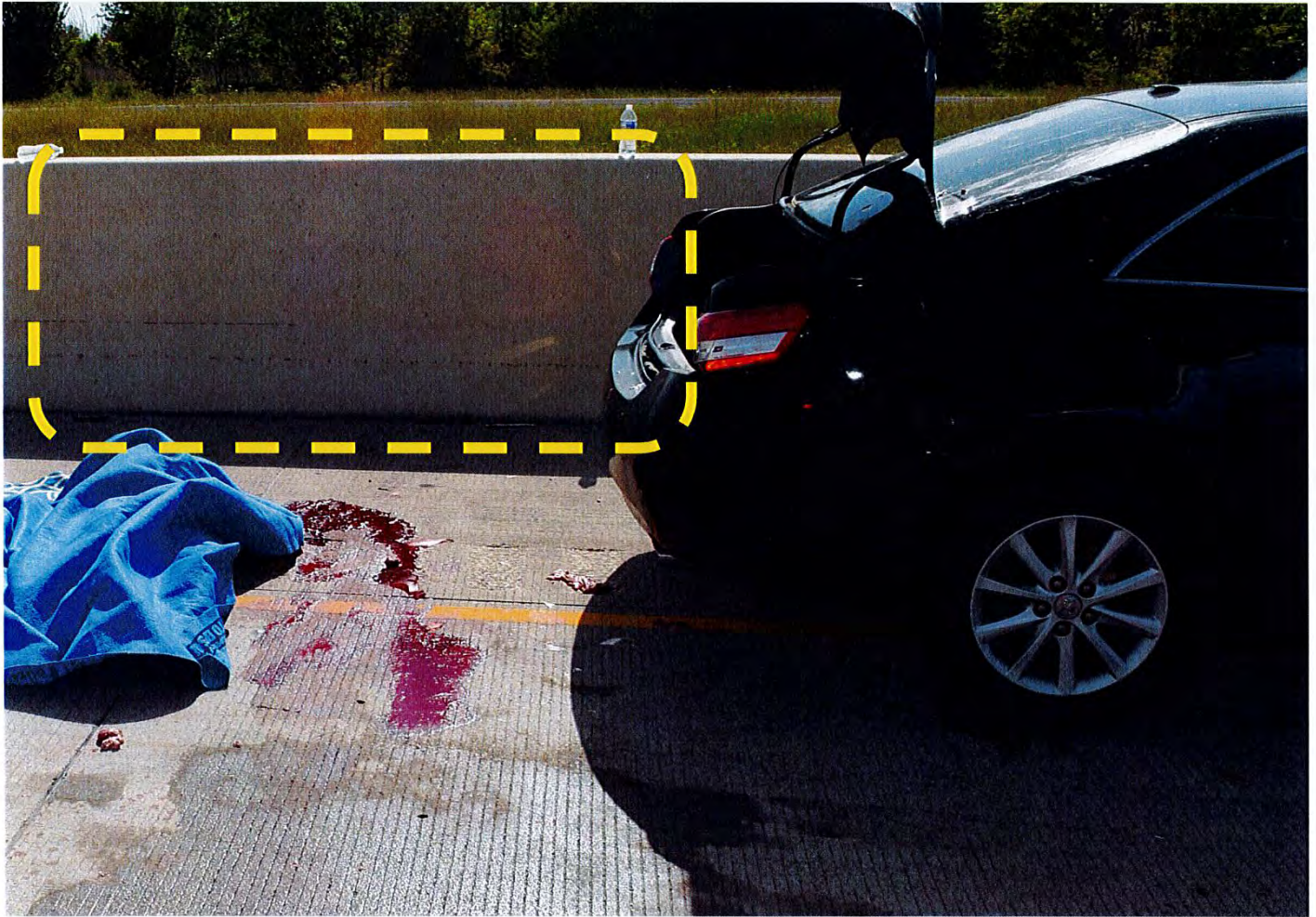


FIGURE 4. TX DPS DSC_0012 Bloodstains on barrier.

00476.118002339

App. 000516

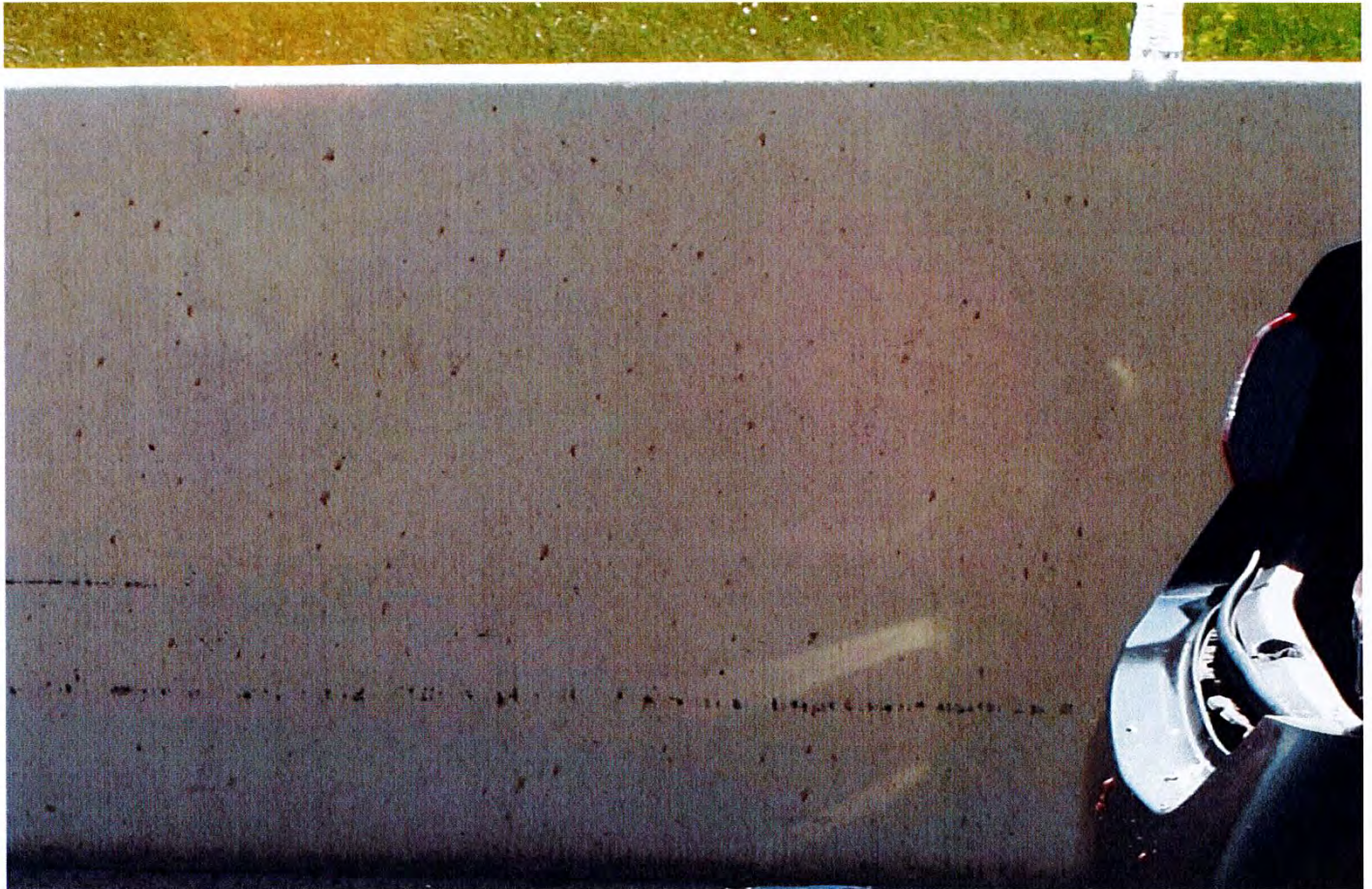


FIGURE 5. TX DPS DSC_0012

Circular and elliptical bloodstains on barrier.

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App. 000517

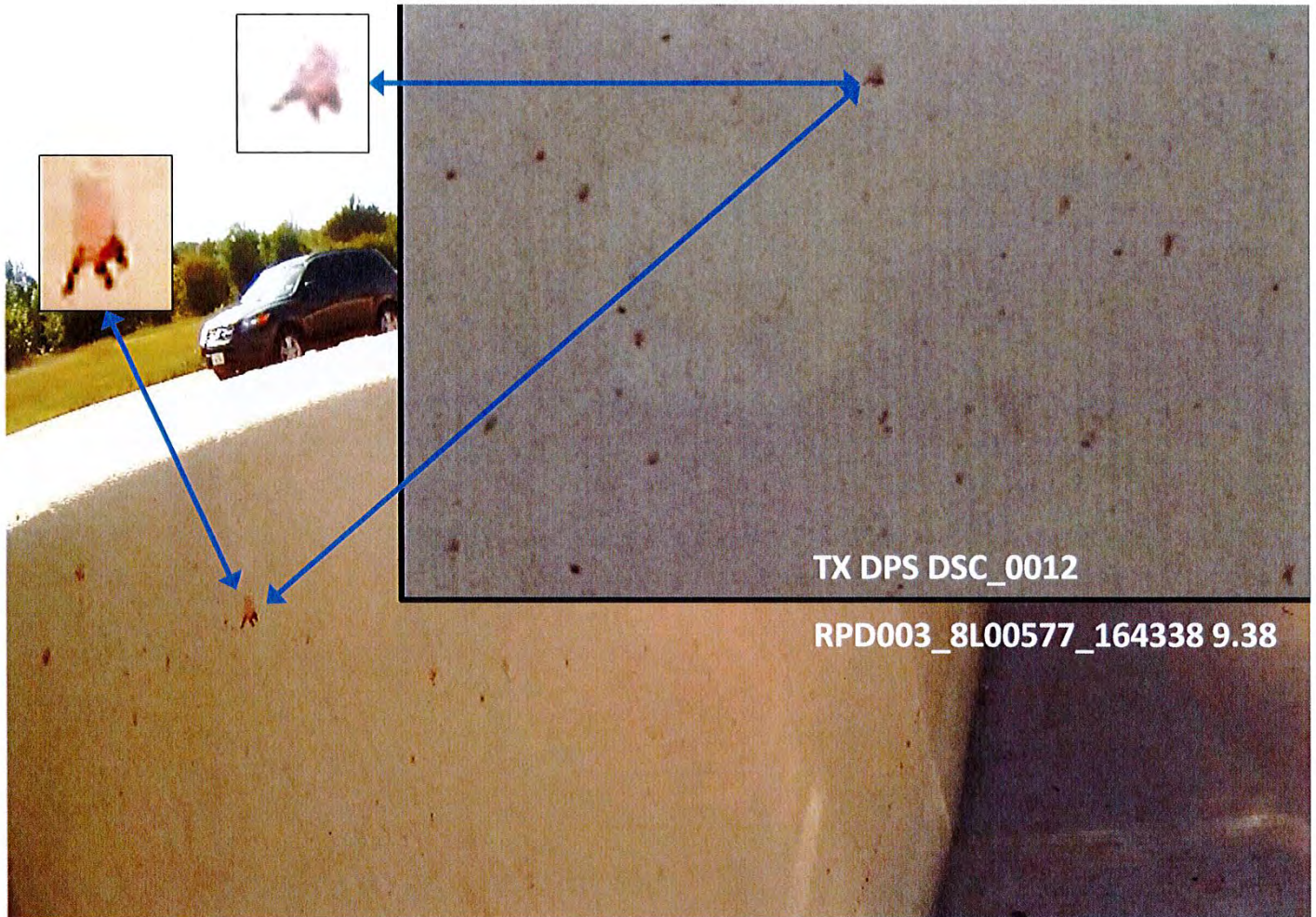


FIGURE 6. Two views of bloodstains on barrier.



FIGURE 7. TX DPS DSC_0023. Blood on barrier west of car.

00476.118002342

App. 000519



FIGURE 8. TX DPS DSC_0017. Stains on west side of Camry.

00476.118002343

App. 000520



FIGURE 9. TX DPS DSC_0023. Stains on rear of Camry.

00476.118002344

App. 000521



FIGURE 10. TX DPS DSC_0017. Tissue debris around trunk.

00476.118002345

App. 000522

Tissue debris marked.



FIGURE 11. TX DPS DSC_00. Rear of Camry.

00476.118002346

App. 000523



FIGURE 12. TX DPS DSC_0023. Rear of Camry.

00476.118002347

App. 000524



FIGURE 13. TX DPS DSC_0011. Right side of Camry.

00476.118002348

App. 000525

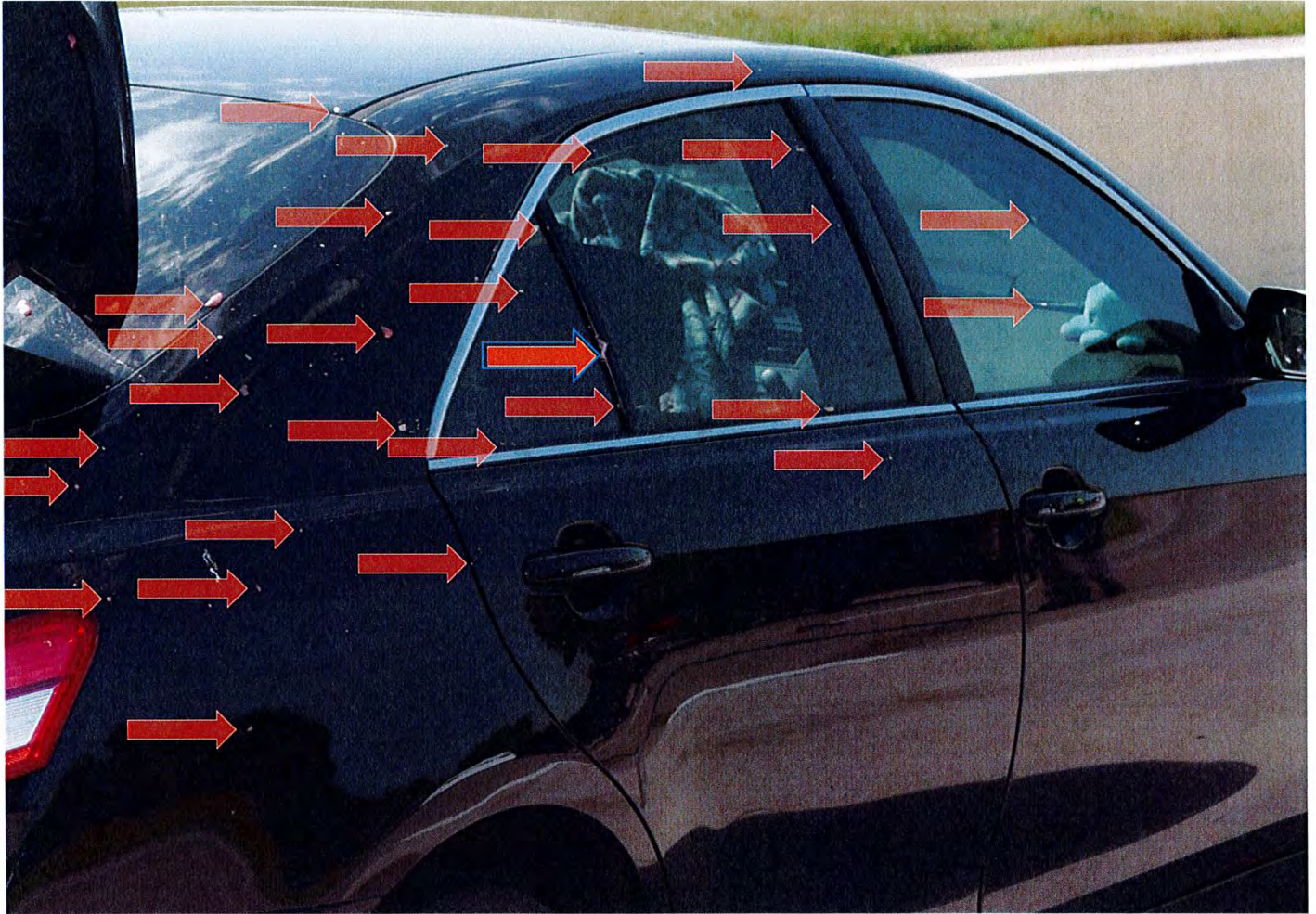


FIGURE 14. TX DPS DSC_0023. Right side of Camry.

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App. 000526

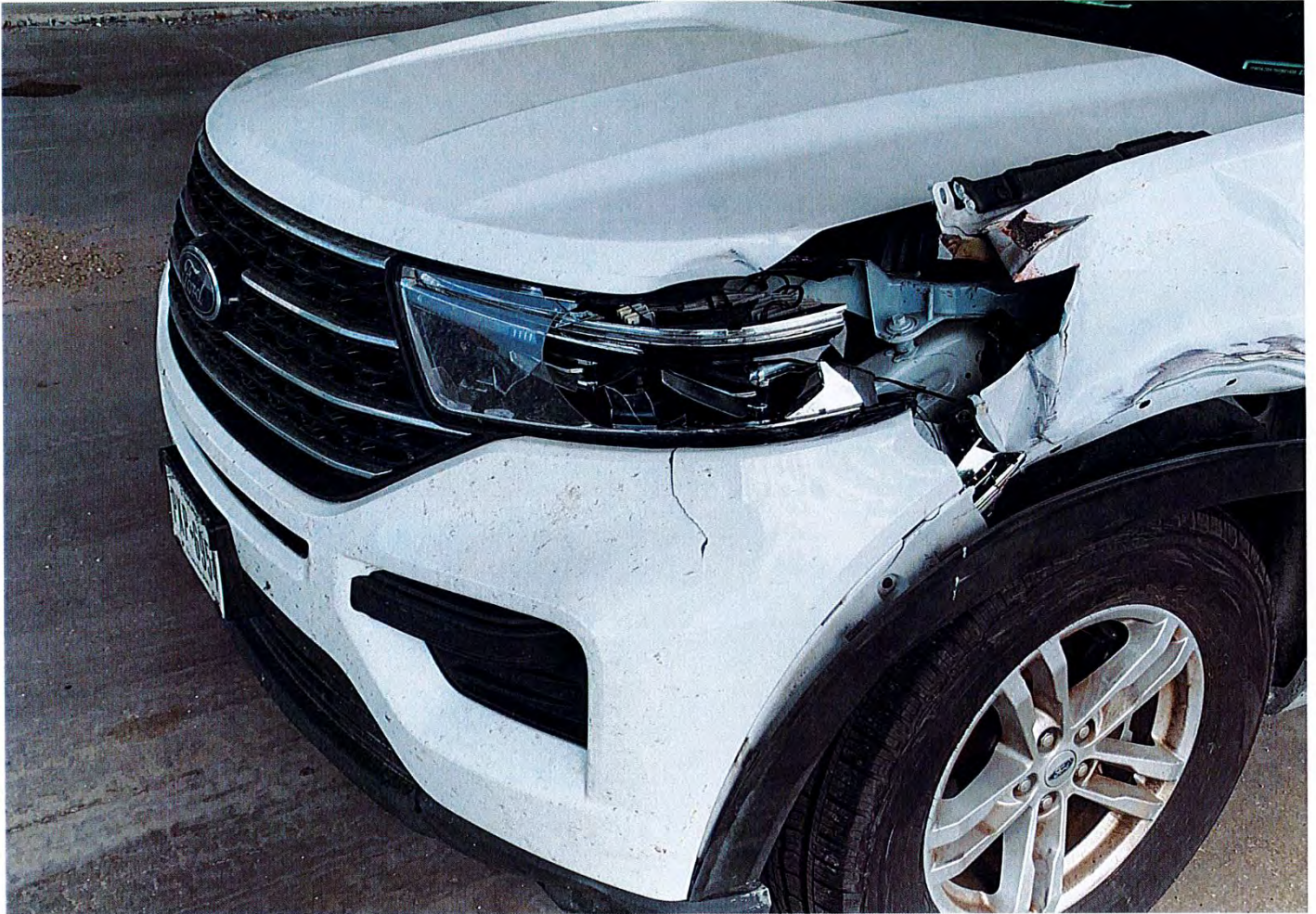


FIGURE 15. TX DPS IMG_1406 Ford Explorer.

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App. 000527



FIGURE 16. TX DPS IMG_1406 Ford Explorer.

00476.118002351

App. 000528



FIGURE 17. Richland PD 2200089 - Photos_Part1_9

00476.118002352

App. 000529



FIGURE 18. TX DPS IMG_1405 Ford Explorer.

00476.118002353

App. 000530



FIGURE 19. Approximation of Nehemias Santos' posture.

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App. 000531

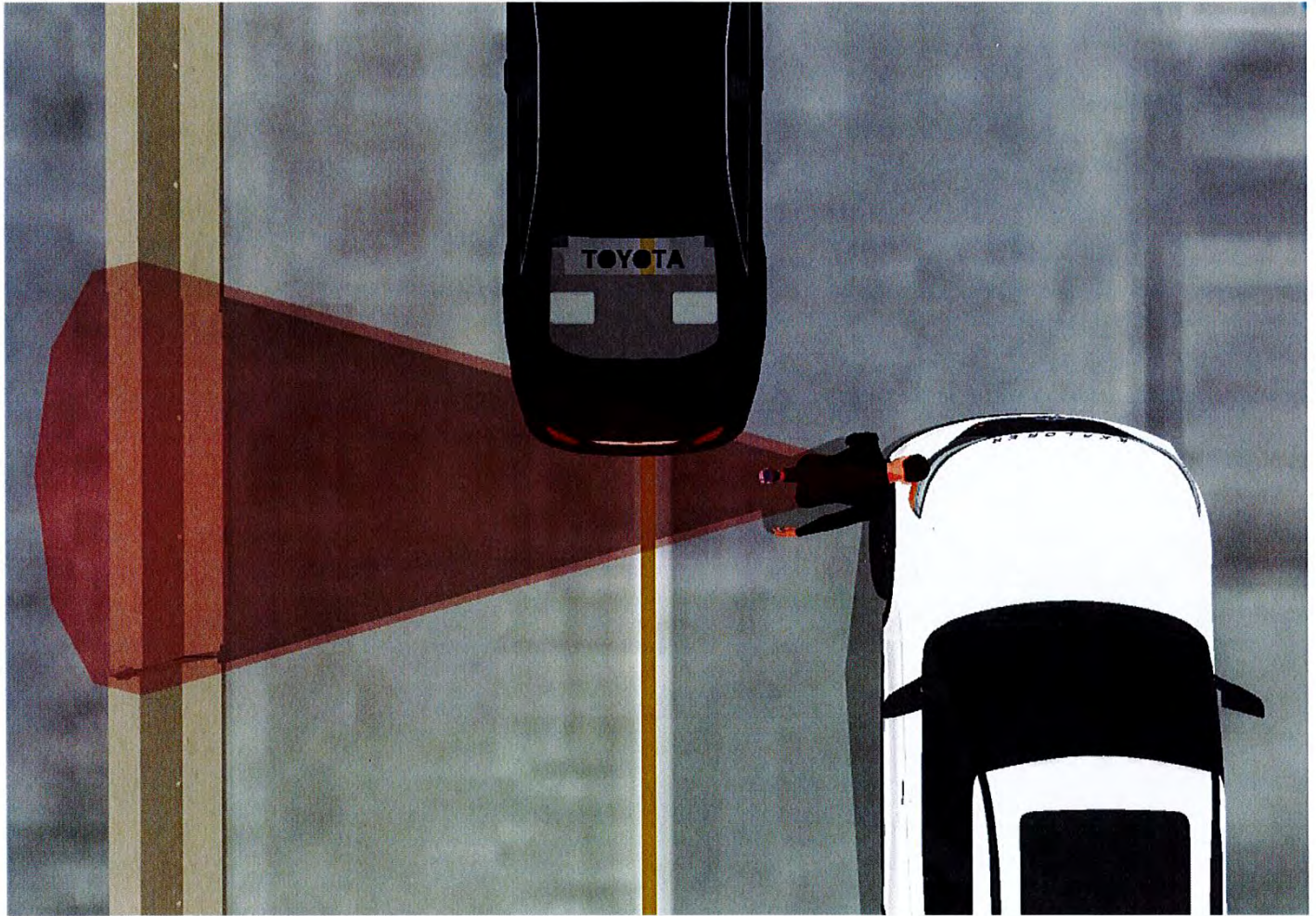
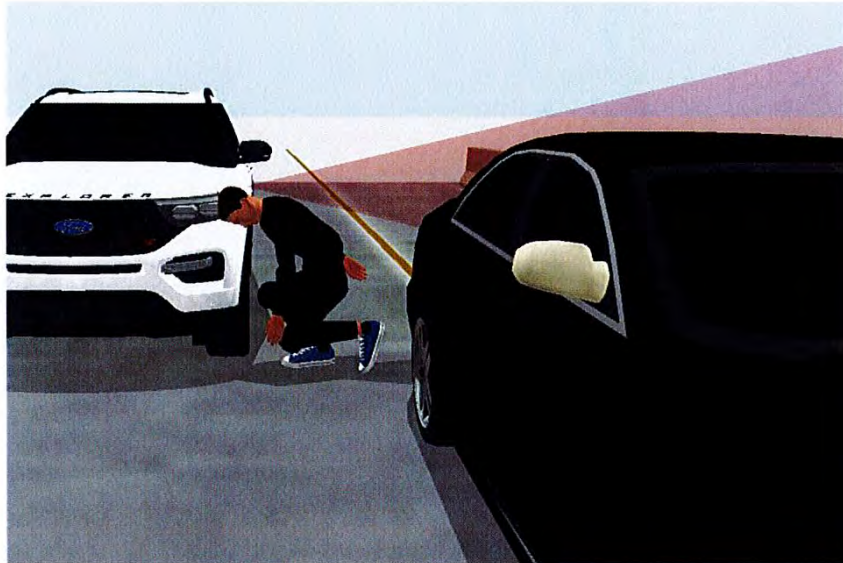


FIGURE 20. Cone indicating blood impact spatter to barrier.

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App. 000532



Blood drops travelled unobstructed from impact site to east side of center barrier.



FIGURE 21. Cone indicating blood impact spatter to barrier.

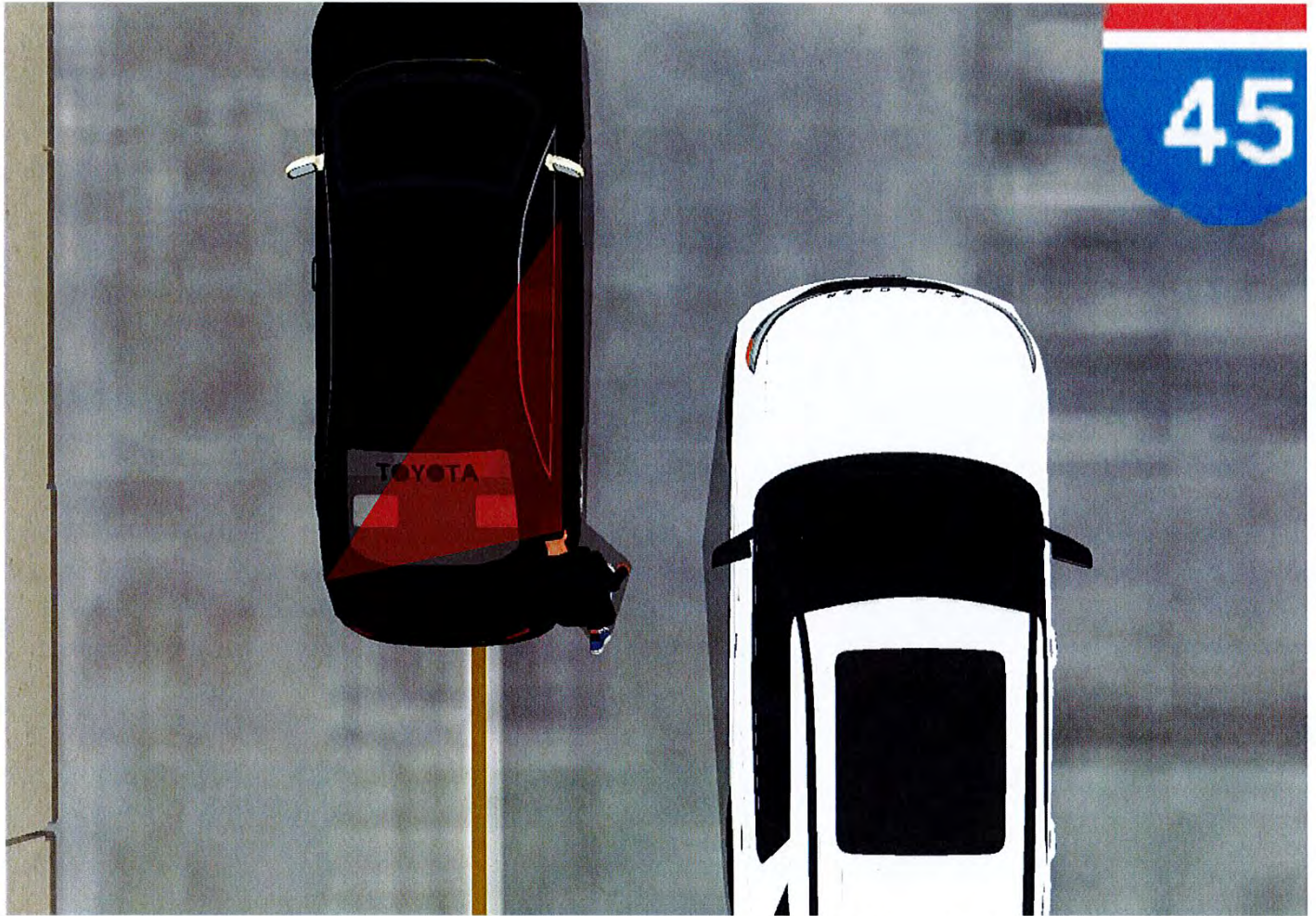


FIGURE 22. Body hit Camry, cone area of blood/tissue.

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App. 000534

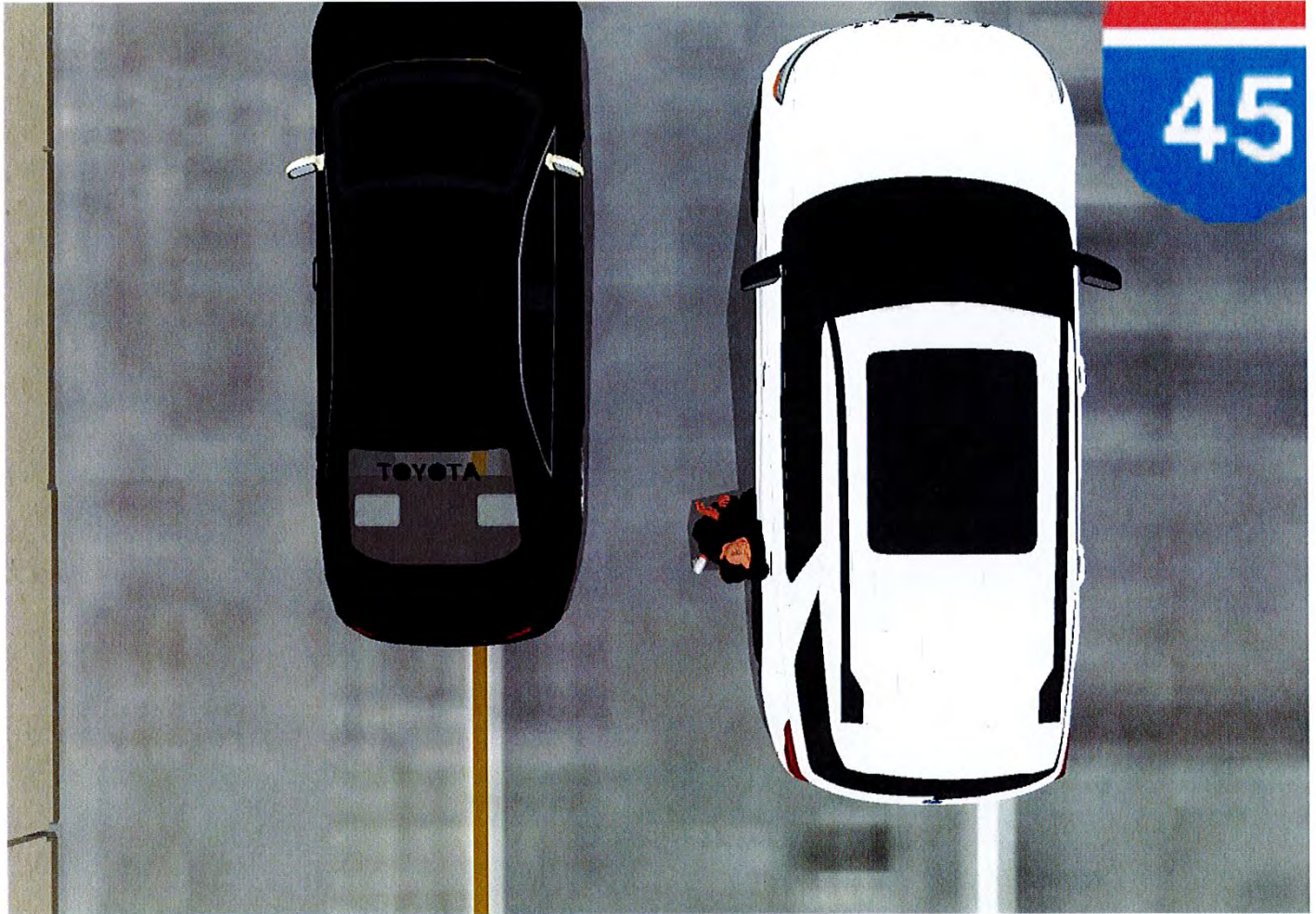


FIGURE 23. Body hit Explorer, blood swipe on Explorer.

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App. 000535



FIGURE 24. TX DPS DSC_0011. Blood pool on roadway.

00476.118002359

App. 000536

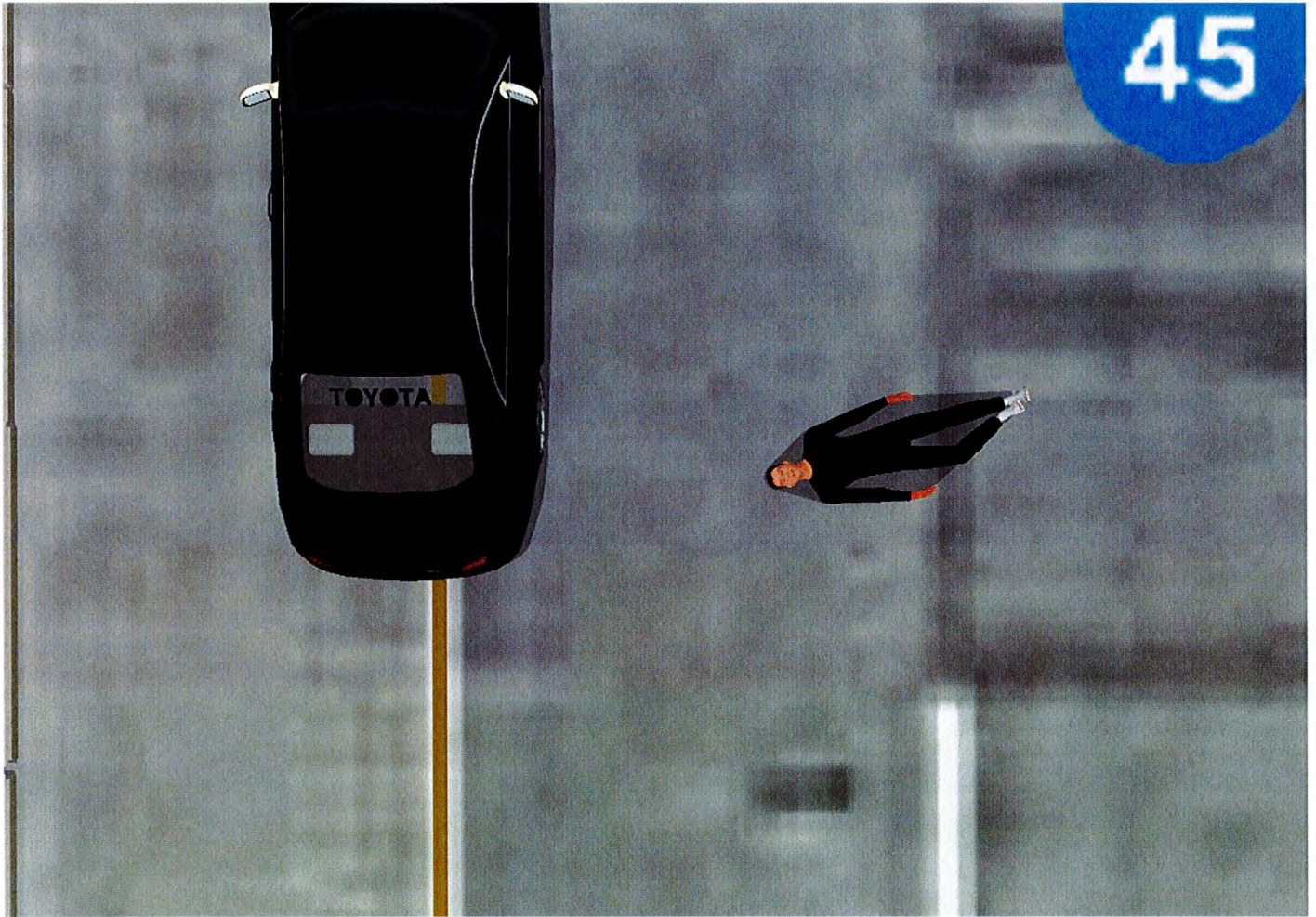


FIGURE 25. Body fell to pavement, blood pooled from head.

00476.118002360

App. 000537

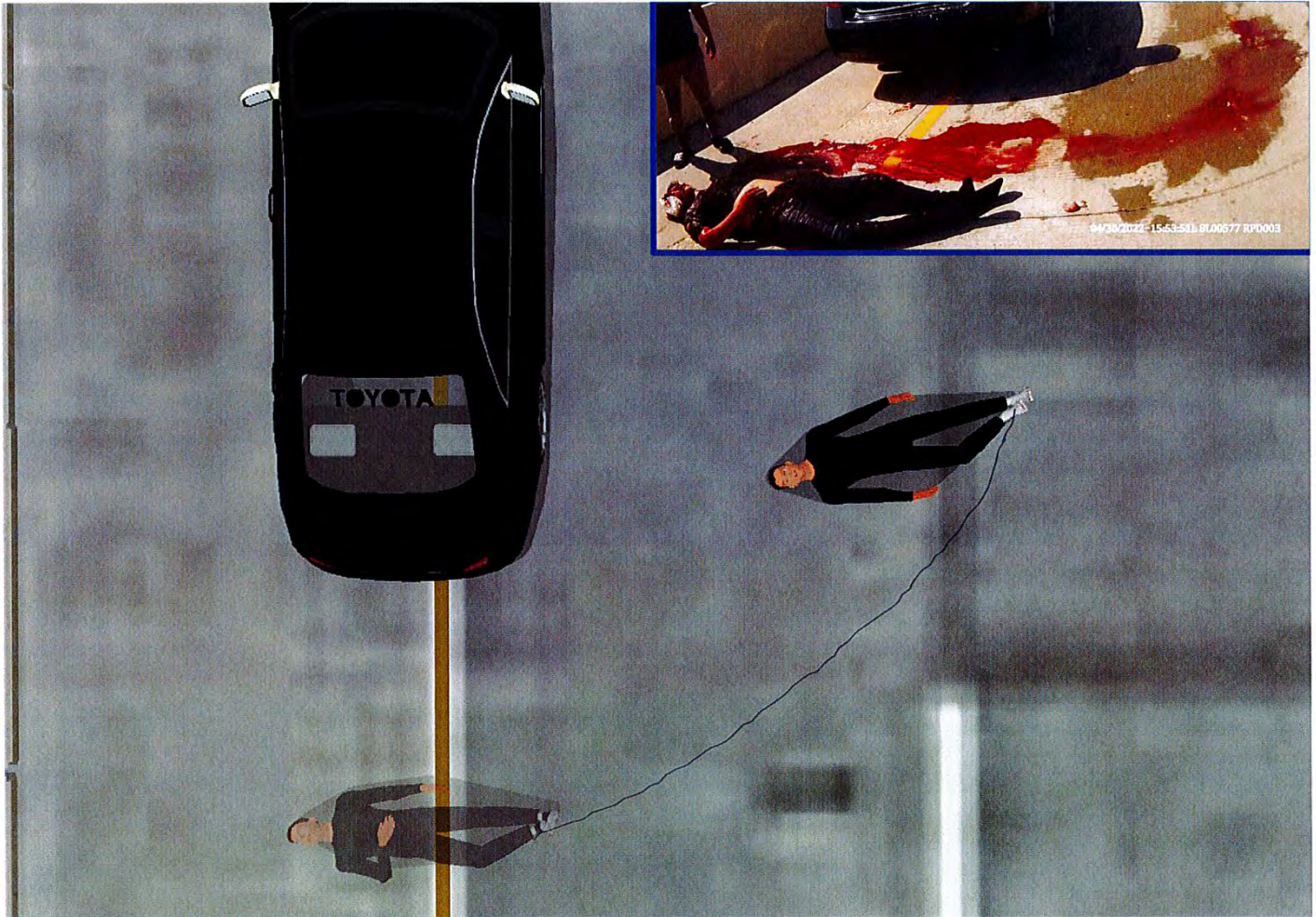


FIGURE 26. Body dragged behind Camry.

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App. 000538



FIGURE 27. RPD003_8L00577_164348 8.38.

00476.118002362

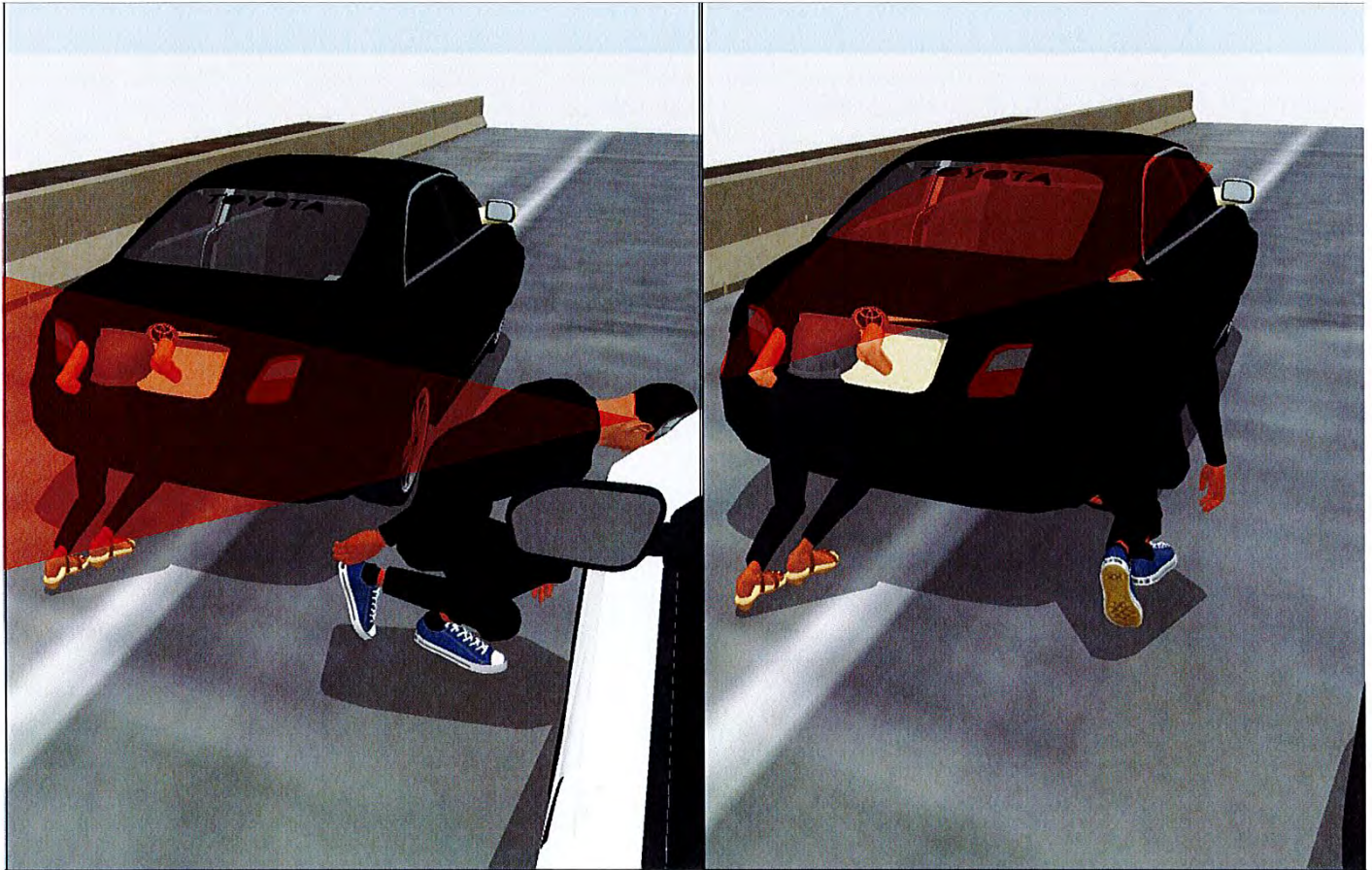
App. 000539



FIGURE 28. Bodycam images of Evelyn Moreno at scene.

00476.118002363

App. 000540



Shaded area indicating approximate path of spatter.

FIGURE 29. Scenarios with Moreno in Camry trunk at impact.

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App. 000541



FIGURE 30. Bodycam images of Eric Pivaral at scene.

00476.118002365

App. 000542

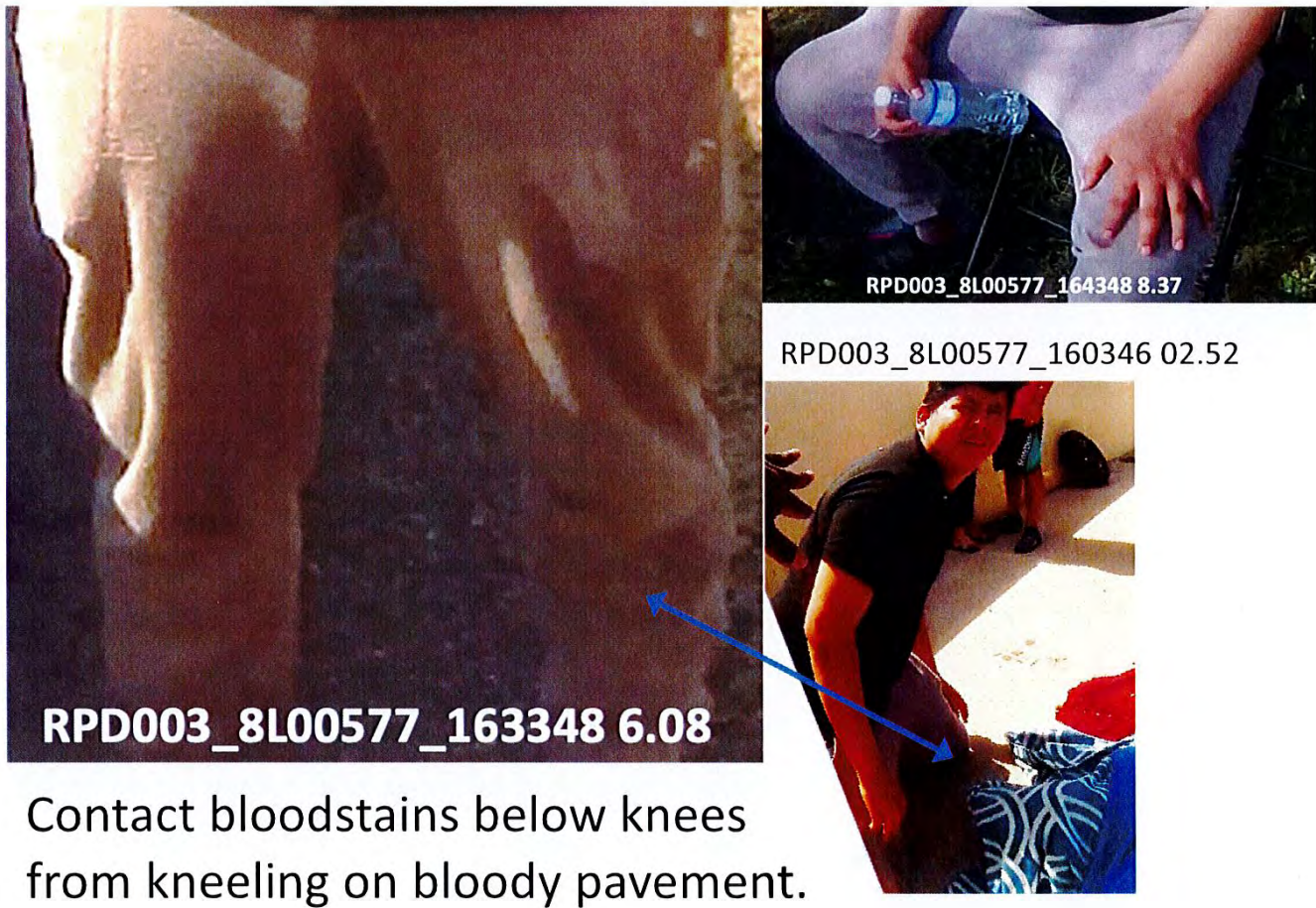


FIGURE 31. Bodycam images of Eric Pivaral at scene.



FIGURE 32. Bodycam images of Melvin Diaz at scene.

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App. 000544



FIGURE 33. Bodycam images of Dina Regalado at scene.

00476.118002368

App. 000545

EXHIBIT G



